

Access DB# 114994**SEARCH REQUEST FORM**

Scientific and Technical Information Center

Requester's Full Name: Maribel Meding Examiner #: 76077 Date: 2/24/04  
Art Unit: 1754 Phone Number 30 Serial Number: 101083976  
Mail Box and Bldg/Room Location: 9A24 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

**STAFF USE ONLY**Searcher: ES

Searcher Phone #: \_\_\_\_\_

Searcher Location: \_\_\_\_\_

Date Searcher Picked Up: \_\_\_\_\_

Date Completed: 2-26-04Searcher Prep & Review Time: 15Clerical Prep Time: 15Online Time: 80**Type of Search**

NA Sequence (#) \_\_\_\_\_

AA Sequence (#) \_\_\_\_\_

Structure (#) (1)Bibliographic (and)

Litigation \_\_\_\_\_

Fulltext \_\_\_\_\_

Patent Family \_\_\_\_\_

Other \_\_\_\_\_

**Vendors and cost where applicable**STN 11 \$ 219.87

Dialog \_\_\_\_\_

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Dr.Link \_\_\_\_\_

Lexis/Nexis \_\_\_\_\_

Sequence Systems \_\_\_\_\_

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**Smith, Teresa (ASRC)**

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**From:** Unknown@Unknown.com  
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**ResponseHeader=Commercial Database Search Request**

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**MyDate=Mon Feb 23 16:19:16 EST 2004**

**submitto=STIC-EIC1700@uspto.gov**

**Name=Maribel Medina**

**Empno=76677**

**Phone=571-272-1355**

**Artunit=1754**

**Office=rem-9A24**

**Serialnum=10/083,976**

**PatClass=423/396**

**Earliest=2/27/02**

**Format1=paper**

**Format3=email**

**Searchtopic=method of making hexammine cobaltic salt. The salt could be any of chloride, perchlorate, nitrate, and bromide.**

(L4)

(L5)

(L6)

(L7)

Comments=

send=SEND

=> file reg

FILE 'REGISTRY' ENTERED AT 11:23:58 ON 26 FEB 2004  
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FILE 'REGISTRY' ENTERED AT 10:10:20 ON 26 FEB 2004

E HEXAMMINE COBALT/CN

L1 1 S E4

L2 855 S 14695-95-5/CRN

E HEXAAMMINE COBALT PERCHLORATE/CN

E HEXAAMMINECOBALT PERCHLORATE/CN

E HEXAAMMINECOBALT(III) PERCHLORATE/CN

L3 1 S E3

E HEXAAMMINECOBALT(III) CHLORIDE/CN

L4 1 S E3

E HEXAAMMINECOBALT(III) NITRATE/CN

L5 24 S L2 AND NO3

L6 1 S L5 AND 2/NC

E HEXAAMMINECOBALT(III) BROMIDE/CN

E HEXAAMMINECOBALT(III) TRIBROMIDE/CN

E HEXAAMMINECOBALT TRIBROMIDE/CN

L7 1 S E3

FILE 'HCAPLUS' ENTERED AT 10:23:56 ON 26 FEB 2004

L8 151 S TINGEY D?/AU

L9 13335 S SMITH R?/AU

L10 1 S L8 AND L9

FILE 'REGISTRY' ENTERED AT 10:29:46 ON 26 FEB 2004

E AMMONIUM HYDROXIDE/CN

L11 1 S E3

E AMMONIUM NITRATE/CN

L12 1 S E3

E OXYGEN/CN

L13 1 S E3

E COBALT NITRATE/CN

L14 2 S E3

E COBALT CHLORIDE/CN

L15 2 S E3

E COBALT PERCHLORATE/CN

L16 3 S E3

E COBALT BROMIDE/CN

L17 2 S E3

FILE 'HCA' ENTERED AT 10:56:37 ON 26 FEB 2004

L18 120746 S L11 OR (AMMONIUM# OR NH4) (W)HYDROXIDE# OR NH4OH OR (AQ#  
L19 37134 S L12 OR (AMMONIUM# OR NH4) (W)NITRATE# OR NH4NO3  
L20 338906 S L13  
L21 4588 S L14 OR (COBALT# OR CO) (W)NITRATE# OR CO2(W)NO3(W) 3  
L22 31961 S L15 OR L17 OR (COBALT# OR CO) (W) (CHLORIDE# OR DICHLORID  
L23 978 S L16 OR (COBALT# OR CO) (W)PERCHLORATE# OR CO(W)CLO4  
L24 729 S L4  
L25 19 S L4/P  
L26 97 S L3  
L27 5 S L3/P  
L28 148 S L6  
L29 4 S L6/P  
L30 57 S L7  
L31 1 S L7/P  
L32 18 S (L24 OR L26 OR L28 OR L30) AND (L18 OR L19) AND (L21 OR  
L33 2 S L32 AND L20  
L34 9 S L27 OR L29 OR L31 OR L33  
L35 30 S (L25 OR L32) NOT L34

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=> d l34 1-9 cbib abs hitstr ind

*application  
inventors*

L34 ANSWER 1 OF 9 HCA COPYRIGHT 2004 ACS on STN

139:199530 Synthesis of cobalt hexaammine trinitrate with a defined  
particle size. Tingey, Douglas R.; Smith, Robert G. (USA). U.S.  
Pat. Appl. Publ. US 2003161779 A1 20030828, 15 pp. (English).  
CODEN: USXXCO. APPLICATION: US 2002-83976 20020227.

AB A hexammine cobaltic salt, such as hexammine cobaltic nitrate,  
having a selected particle size is prep'd. by introducing a cobalt  
salt, esp. **cobalt nitrate**, and an ammonium salt,  
esp. **ammonium nitrate**, to an ammonia source,  
such as **ammonium hydroxide**, in a reaction vessel  
to form  $\text{Co}(\text{NH}_3)_5(\text{H}_2\text{O})(\text{NO}_3)_2$  which is oxidized by  
mol. oxygen to form  $\mu$ -peroxobis[pentamminecobalt]. The  
 $\mu$ -peroxobis[pentamminecobalt] is heated to form pentammine-aqua  
cobaltic nitrate. An activated carbon catalyst and oxygen are added

to the pentammine-aqua cobaltic nitrate while maintaining the temp. at 95-120°F to yield hexammine cobaltic nitrate having a particle size of 35-60  $\mu$ . The hexammine cobaltic nitrate can be used as a gas-generating material for inflatable automotive airbags.

IT 10534-86-8P, Cobalt(3+), hexaammine-, trinitrate  
(synthesis of cobalt hexaammine trinitrate with defined particle size)

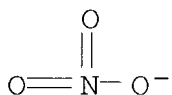
RN 10534-86-8 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, trinitrate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-55-8

CMF N O3

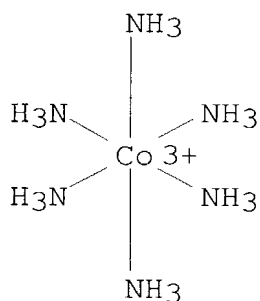


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



IT 1336-21-6, Ammonium hydroxide  
6484-52-2, Ammonium nitrate, reactions  
7782-44-7, Oxygen, reactions 10141-05-6,  
Cobalt nitrate

(synthesis of cobalt hexaammine trinitrate with defined particle size)

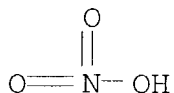
RN 1336-21-6 HCA

CN Ammonium hydroxide ((NH4)(OH)) (9CI) (CA INDEX NAME)

H<sub>4</sub>N-OH

RN 6484-52-2 HCA

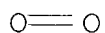
CN Nitric acid ammonium salt (8CI, 9CI) (CA INDEX NAME)



● NH<sub>3</sub>

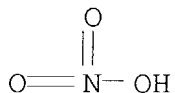
RN 7782-44-7 HCA

CN Oxygen (8CI, 9CI) (CA INDEX NAME)



RN 10141-05-6 HCA

CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



● 1/2 Co(II)

IC ICM C01G051-12

NCL 423396000

CC 50-1 (Propellants and Explosives)

Section cross-reference(s): 49

ST cobalt hexaammine trinitrate synthesis oxidn catalyst particle size  
airbag

IT Airbags (protective)

Particle size

Propellants (fuels)

(synthesis of cobalt hexaammine trinitrate with defined particle  
size)

IT 7440-44-0, Carbon, uses

(activated; synthesis of cobalt hexaammine trinitrate with  
defined particle size)

IT 10534-86-8P, Cobalt(3+), hexaammine-, trinitrate

(synthesis of cobalt hexaammine trinitrate with defined particle size)

IT 1336-21-6, Ammonium hydroxide  
6484-52-2, Ammonium nitrate, reactions  
7782-44-7, Oxygen, reactions 10141-05-6,  
Cobalt nitrate

(synthesis of cobalt hexaammine trinitrate with defined particle size)

L34 ANSWER 2 OF 9 HCA COPYRIGHT 2004 ACS on STN

133:60964 High-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags. Lundstrom, Norman H.; Begin, Laurence C. (Automotive Systems Laboratory, Inc., USA). U.S. US 6077371 A 20000620, 12 pp. (English). CODEN: USXXAM. APPLICATION: US 1997-797398 19970210.

AB High-nitrogen gas generating compns., useful for inflating passenger restraint gas inflator bags, contain, as a secondary oxidant, a nitrogen-rich coordination compd. of general formula (NM)<sub>u</sub>M<sub>x</sub>[M'<sub>w</sub>(NO<sub>2</sub>)<sub>z</sub>], in which: (1) NM is a nonmetal cation, (2) M is an alkali metal or alk. earth metal ion, (3) M' is a Group 4-12 coordination (transition) metal, (4) u = 1-4, x = 0-3, w = 1-3, and z = 4 or 6 nitrito or nitro groups, depending on the stoichiometry of NM and M'. The nonmetal (NM) is selected from ammonia, hydrazine, hydroxylamine, and linear and cyclic amines (e.g., guanidine and guanidine derivs., tetrazole derivs., and aminofurazans). The gas-generating compns. generate relatively more gas and less solids, and are safer than azide-based gas-generating compns. Novel methods for the synthesis of nonmetal coordination complexes (e.g., with guanidine and hydrazine) were also presented.

IT 10534-86-8P 13820-83-2P, Hexaamminecobalt(III) perchlorate

(oxidant, synthesis and use of; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags).

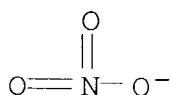
RN 10534-86-8 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, trinitrate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-55-8

CMF N 03



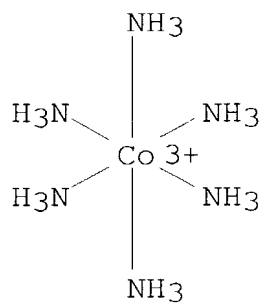


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



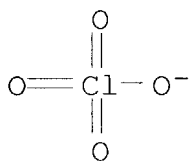
RN 13820-83-2 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, triperchlorate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-73-0

CMF Cl O4

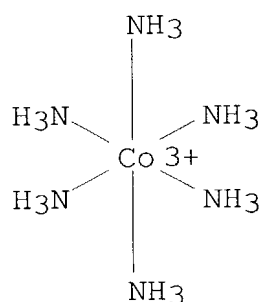


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



IC ICM C06B031-00  
ICS C06B033-00  
NCL 149037000  
CC 50-1 (Propellants and Explosives)  
Section cross-reference(s): 29  
ST nonazide gas generator propellant vehicle airbag; safety vehicle  
airbag nonazide propellant; transition metal nitro complex  
propellant oxidant; nitrite transition metal complex propellant  
oxidant  
IT Polysiloxanes, uses  
(C10-20-alkyl Me di-Me, processing aid; high-nitrogen transition  
metal nitro or nitrito complexes in non-azide propellants for  
inflation of vehicle airbags)  
IT Group VIII element complexes  
(Group 10, ballistic modifiers; high-nitrogen transition metal  
nitro or nitrito complexes in non-azide propellants for inflation  
of vehicle airbags)  
IT Group VIII elements  
(Group 9, complexes, ballistic modifiers; high-nitrogen  
transition metal nitro or nitrito complexes in non-azide  
propellants for inflation of vehicle airbags)  
IT Metallocenes  
(ballistic modifiers, propellants contg.; high-nitrogen  
transition metal nitro or nitrito complexes in non-azide  
propellants for inflation of vehicle airbags)  
IT Alkali metal complexes  
Alkaline earth complexes  
Group IB element complexes  
Group IIB element complexes  
Group IIIA element complexes  
Group IIIB element complexes  
Group IVB element complexes  
Group VIIB element complexes  
(ballistic modifiers; high-nitrogen transition metal nitro or  
nitrito complexes in non-azide propellants for inflation of  
vehicle airbags)

- IT Clays, uses  
(bentonitic, inert slag former and coolant; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Group VIII element complexes  
(bimetallic, ballistic modifiers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Group VIII element compounds  
(chelates, ballistic modifiers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Group IVA element compounds  
Group VA element compounds  
Group VIA element compounds  
(complexes, ballistic modifiers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Nitramines  
(cyclic and linear, oxidizers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Polycyanurates  
(fuel component; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Airbags (protective)  
(high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Carbon black, uses  
Transition metal hydrides  
(ignition aid; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Aluminates  
Borosilicates  
Clays, uses  
Diatomite  
High-silica glasses  
Lime (chemical)  
Silicates, uses  
(inert slag former and coolant; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Coordination compounds  
(metal-hydrazine and metal polynitrito metalate, oxidizers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)

- IT Cage compounds  
(nitramines, oxidizers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Transition metal complexes  
(nitrite, oxidants; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Transition metal complexes  
(nitrogen heterocyclic, oxidants; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Heterocyclic compounds  
(nitrogen, five-membered, fuel component; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Heterocyclic compounds  
Heterocyclic compounds  
(nitrogen, transition metal complexes, oxidants; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Ammine complexes  
Chlorates  
Chlorites  
Chromates  
Halides  
Nitrates, uses  
Nitrites  
Oxides (inorganic), uses  
Perchlorates  
Peroxysulfates  
Sulfates, uses  
Sulfides, uses  
(oxidizers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Peroxysulfates  
(peroxydisulfates, oxidizers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Acetals  
(polyacetals, nonpolymeric, processing aid; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT Alcohols, uses  
Fluoropolymers, uses  
Paraffin waxes, uses  
Polycarbonates, uses

Polyoxyalkylenes, uses

Polyoxymethylenes, uses

(processing aid; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)

IT Propellants (fuels)

(solid; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)

IT 79-17-4, Aminoguanidine 108-78-1, 1,3,5-Triazine-2,4,6-triamine, uses 108-78-1D, 2,4,6-Triamino-s-triazine, salts 113-00-8, Guanidine 113-00-8D, Guanidine, derivs. 288-88-0D, 1H-1,2,4-Triazole, derivs. 288-94-8, 1H-Tetrazole 288-94-8D, 1H-Tetrazole, derivs. 288-94-8D, 1H-Tetrazole, metal salts 302-01-2, Hydrazine, uses 302-01-2D, Hydrazine, derivs., uses 471-46-5, Oxamide 506-93-4, Guanidine nitrate 556-88-7, Nitroguanidine 932-64-9, 3-Nitro-1,2,4-triazol-5-one 932-64-9D, 3-Nitro-1,2,4-triazol-5-one, salts 996-98-5, Oxalyldihydrazide 2203-24-9, Triaminoguanidine 2783-98-4, 5,5'-Bitetrazole 2783-98-4D, 5,5'-Bitetrazole, derivs. 3232-84-6, Urazole 4000-16-2, Triaminoguanidine nitrate 4104-85-2, Triaminoguanidine perchlorate 4364-78-7, Diaminoguanidine 4418-61-5, 5-Aminotetrazole 4418-61-5D, 5-Aminotetrazole, metal salts 7803-49-8, Hydroxylamine, uses 7803-49-8D, Hydroxylamine, derivs., uses 7803-57-8, Hydrazine hydrate 10105-42-7, 1,3,5-Triazine-2,4,6(1H,3H,5H)-trione, trihydrazone 10105-42-7D, 1,3,5-Triazine-2,4,6(1H,3H,5H)-trione, trihydrazone, salts 10308-82-4, Aminoguanidine nitrate 10308-82-4D, Hydrazinecarboximidamide, mononitrate, metal salts 10308-84-6, Guanidine perchlorate 10308-86-8, Triaminoguanidine picrate 15066-38-3, Melamine nitrate 15066-38-3D, Melamine nitrate, salts 15179-29-0, Guanidine, nitro-, monoperchlorate 18264-75-0 18264-75-0D, metal salts 18588-16-4, 5-Nitroaminotetrazole 18588-16-4D, 5-Nitroaminotetrazole, metal salts 19465-89-5, Strontium azide 19597-69-4, Lithium azide 20762-60-1, Potassium azide 21531-96-4, 1,2,4-Triazolidine-3,5-dione, 4-amino- 26628-22-8, Sodium azide 27988-97-2, Tetrazole 27988-97-2D, Tetrazole, derivs. 28623-02-1, 1H-Tetrazole, 5,5'-azobis- 28623-02-1D, 1H-Tetrazole, 5,5'-azobis-, metal salts 34815-01-5, 1H-1,2,4-Triazol-3-amine, N-nitro- 34815-01-5D, 1H-1,2,4-Triazol-3-amine, N-nitro-, salts 37160-07-9, Diaminoguanidine nitrate 37306-44-8D, Triazole, derivs. 55011-46-6, 5-Nitrotetrazole 55011-46-6D, 5-Nitrotetrazole, metal salts 142353-07-9, Guanidine, compd. with 5,5'-azobis[1H-tetrazole] (2:1) 150398-60-0, 1H-1,2,4-Triazole, nitro- 150398-60-0D, 1H-1,2,4-Triazole, nitro-, salts 195388-91-1, 1H-Tetrazole, 5,5'-azobis-, diammonium salt 211948-57-1, 5,5'-Bi-1H-tetrazole, manganese(2+) salt (1:1)

(fuel component; high-nitrogen transition metal nitro or nitrito

complexes in non-azide propellants for inflation of vehicle airbags)

- IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses 7440-32-6, Titanium, uses 7440-42-8, Boron, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses  
(ignition aid; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses  
(inert slag former and coolant; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT 302-01-2DP, Hydrazine, complexes with zinc and nitrate, uses 7440-66-6DP, Zinc, complexes with hydrazine and nitrate, uses **10534-86-8P** 13600-88-9P 13600-98-1P, Sodium cobaltinitrite 13782-01-9P, Cobaltate(3-), hexakis(nitrito-κN)-, tripotassium, (OC-6-11)- **13820-83-2P**, Hexaamminecobalt(III) perchlorate 14040-08-5P 14376-56-8P 14640-47-2P 14652-46-1P, Ammonium hexanitrocobaltate(III) 15363-28-7P 15651-45-3P 31058-64-7P, Copper(2+), tetraammine-, dinitrate 44969-74-6P 61104-87-8P 82312-62-7P 82312-64-9P 277306-02-2P 277306-03-3P 277306-04-4P 277306-05-5P 277306-06-6P 277306-07-7P  
(oxidant, synthesis and use of; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT 121-82-4, RDX 144-62-7D, Oxalic acid, salts 1317-33-5, Molybdenum sulfide (MoS<sub>2</sub>), uses 1317-38-0, Copper oxide, uses 2691-41-0, HMX 6484-52-2, Ammonium nitrate, uses 7631-99-4, Sodium nitrate, uses 7757-79-1, Potassium nitrate, uses 7782-94-7D, Nitramide, salts 7790-98-9, Ammonium perchlorate 10042-76-9, Strontium nitrate 140456-78-6  
(oxidizers; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)
- IT 57-11-4D, Stearic acid, metal salts 63-42-3 7782-42-5, Graphite, uses 9003-20-7, Poly(vinyl acetate) 10043-11-5, Boron nitride, uses 25322-68-3 110320-40-6, Polypropylene carbonate  
(processing aid; high-nitrogen transition metal nitro or nitrito complexes in non-azide propellants for inflation of vehicle airbags)

L34 ANSWER 3 OF 9 HCA COPYRIGHT 2004 ACS on STN

129:332947 Process for the production of hexaammine cobalt

**nitrate** from cobalt salt for gas generants. Bradley, Steve

J.; Blau, Reed J.; Lund, Gary K. (Cordant Technologies, Inc., USA).

PCT Int. Appl. WO 9846529 A1 19981022, 35 pp. DESIGNATED STATES: W:

AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK,

EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2.

APPLICATION: WO 1998-US7157 19980413. PRIORITY: US 1997-43325 19970415.

AB A process is described for producing hexaammine cobalt (III) nitrate from a cobalt (II) salt, e.g.,  $\text{Co}(\text{NO}_3)_2$ . The product is useful in formulating gas generant compns. In an example,  **$\text{NH}_4\text{NO}_3$**  106 lb. (601 mol), aq.  $\text{Co}(\text{NO}_3)_2$  170 lb. (196 mol) and  **$\text{NH}_4\text{OH}$**  207 lb. (1600 mol) were added to a 100-gal reactor under stirring for 5 min. and then aged for 68 h at 24-26°C. Oxygen was fed to the reactor at 15 scfh under heating to 35-40°C and stirring in the presence of an activated carbon catalyst 670 g (56 mol) until an absorbance of <0.110 at 505 nm was reached. The resulting gold/orange ppt. was collected by filtration, washed and dried, yielding 97% HACN. Reaction residues can be recycled in the process. The process is energy efficient and generates min. wastes.

IT 10534-86-8P

(prodn. of hexaammine cobalt nitrate from cobalt salt for gas generants)

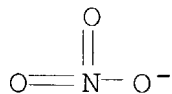
RN 10534-86-8 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, trinitrate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-55-8

CMF N O3

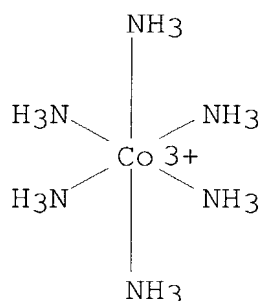


CM 2

CRN 14695-95-5

CMF Co H18 N6

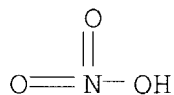
CCI CCS



IT 1336-21-6, Ammonium hydroxide  
 6484-52-2, Ammonium nitrate, reactions  
 7646-79-9, Cobalt dichloride, reactions  
 7782-44-7, Oxygen, reactions 7789-43-7,  
 Cobalt dibromide 10141-05-6, Cobalt  
 dinitrate 13455-31-7, Cobalt diperchlorate  
 (prodn. of hexaammine **cobalt nitrate** from  
 cobalt salt for gas generants)  
 RN 1336-21-6 HCA  
 CN Ammonium hydroxide ((NH<sub>4</sub>)(OH)) (9CI) (CA INDEX NAME)

H<sub>4</sub>N—OH

RN 6484-52-2 HCA  
 CN Nitric acid ammonium salt (8CI, 9CI) (CA INDEX NAME)



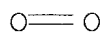
● NH<sub>3</sub>

RN 7646-79-9 HCA  
 CN Cobalt chloride (CoCl<sub>2</sub>) (8CI, 9CI) (CA INDEX NAME)

Cl—Co—Cl

RN 7782-44-7 HCA  
 CN Oxygen (8CI, 9CI) (CA INDEX NAME)

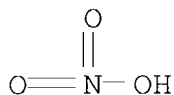




RN 7789-43-7 HCA  
 CN Cobalt bromide (CoBr<sub>2</sub>) (8CI, 9CI) (CA INDEX NAME)

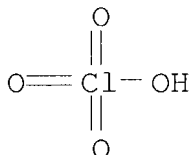


RN 10141-05-6 HCA  
 CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



● 1/2 Co(II)

RN 13455-31-7 HCA  
 CN Perchloric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



● 1/2 Co(II)

IC ICM C01G051-12  
 ICS C06B031-00; C06D005-06  
 CC 49-8 (Industrial Inorganic Chemicals)  
 Section cross-reference(s): 50  
 ST hexaammine **cobalt nitrate** prodn gas generant  
 IT Gas generators  
     (agents for; prodn. of hexaammine **cobalt**  
     **nitrate** from cobalt salt for gas generants)  
 IT 7440-44-0, Carbon, uses  
     (activated; prodn. of hexaammine **cobalt nitrate**  
     from cobalt salt for gas generants)  
 IT 10534-86-8P

(prodn. of hexaammine cobalt nitrate from  
cobalt salt for gas generants)

IT 1336-21-6, Ammonium hydroxide  
6484-52-2, Ammonium nitrate, reactions  
7646-79-9, Cobalt dichloride, reactions  
7664-41-7, Ammonia, reactions 7697-37-2, Nitric acid, reactions  
7782-44-7, Oxygen, reactions 7789-43-7,  
Cobalt dibromide 7790-98-9, Ammonium perchlorate  
10141-05-6, Cobalt dinitrate 12124-97-9, Ammonium bromide  
12125-02-9, Ammonium chloride, reactions 13455-31-7,  
Cobalt diperchlorate  
(prodn. of hexaammine cobalt nitrate from  
cobalt salt for gas generants)

L34 ANSWER 4 OF 9 HCA COPYRIGHT 2004 ACS on STN

114:198553 Reactions of coordinated imidazole. Oxidation products and  
ring cleavage in the reactions of  $\text{RImH}_3^+$  ( $\text{R} = \text{pentaamminecobalt}$ )  
with acetyl hypobromite and hypobromous acid. Blackman, Allan G.;  
Buckingham, David A.; Clark, Charles R.; Simpson, Jim (Dep. Chem.,  
Univ. Otago, Dunedin, N. Z.). Inorganic Chemistry, 30(7), 1635-42  
(English) 1991. CODEN: INOCAJ. ISSN: 0020-1669.

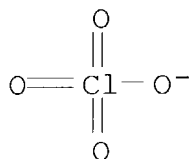
AB Treatment of  $(\text{NH}_3)_5\text{Co}(\text{ImH})_3^+$  ( $\text{ImH} = \text{imidazole}$ ) with aq.  $\text{Br}_2$  in  $\text{AcO}^-$   
(or  $\text{PO}_4^{3-}$ ) buffer at pH 4-6 results in  $(\text{NH}_3)_5\text{CoX}_2^+$  as the only  
product ( $\text{HX} = \text{parabanic acid} = \text{imidazolidine-2,4,5-trione}$ ). A  
crystal structure of  $[(\text{NH}_3)_5\text{CoX}]\text{Cl}_2 \cdot 3\text{H}_2\text{O}$  (orthorhombic, space group  
 $\text{P}2_12_12_1$ ,  $a$  6.936(1),  $b$  11.032(3),  $c$  19.652(3) Å,  $Z = 4$ ;  $R =$   
0.0491,  $R_w = 0.0596$ ) is reported. Formation of  $(\text{NH}_3)_5\text{CoX}_2^+$  appears  
to occur via initial reaction with  $\text{Br}_2(\text{aq})$  to give 4,5-dibrominated  
imidazole complex and 2,4,5-tribrominated imidazolato complex,  
followed by further bromination at C-2 by  $\text{AcOBr}$  to give a tetrabromo  
species, which rapidly hydrolyses. The same product results from  
oxidn. by  $\text{Cl}_2(\text{aq})$  in the absence of  $\text{AcO}^-$  buffer. Treatment of  
 $(\text{NH}_3)_5\text{Co}(\text{ImH})_3^+$  with  $\text{HOBr}$  in aq. soln. results in 3 main products.  
These were identified as  $(\text{NH}_3)_5\text{CoQ}_2^+$  ( $\text{HQ} = \text{dioxamide}$ ),  
 $(\text{NH}_3)_5\text{Co}[\text{N}(\text{CHO})_2]_2^+$ , and  $(\text{NH}_3)_5\text{CoZ}_2^+$  ( $\text{Z} = 2\text{-hydroxyimidazolidine-4,5-}$   
 $\text{dione}$ ). A crystal structure of  $[(\text{NH}_3)_5\text{CoZ}](\text{CF}_3\text{SO}_3)_2$  (monoclinic,  
space group  $\text{C}2/\text{m}$ ,  $a$  32.325(20),  $b$  8.037(4),  $c$  7.195(5) Å,  $\beta$   
91.92 (5)°,  $Z = 4$ ,  $R = 0.0951$ ,  $R_w = 0.1034$ ) is reported.

IT 13820-83-2P, Hexaamminecobalt triperchlorate  
(formation of, in hydrolysis of cobalt ammine dioxamido complex)  
RN 13820-83-2 HCA  
CN Cobalt(3+), hexaammine-, (OC-6-11)-, triperchlorate (9CI) (CA INDEX  
NAME)

CM 1

CRN 14797-73-0

CMF Cl O4

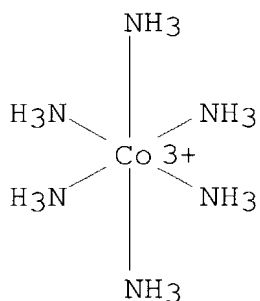


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



CC 78-9 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 75

ST cobalt coordinated imidazole oxidn ring cleavage; crystal structure  
cobalt ammine parabanato hydroxyimidazolidinedione; structure cobalt  
ammine parabanato hydroxyimidazolidinedione complex

IT Crystal structure

Molecular structure

(of cobalt ammine complexes with hydroxyimidazolidinedione and  
parabanate)

IT Oxidation

(of cobalt-coordinated imidazole by bromine in presence of  
acetate and hypobromous acid)

IT Ring cleavage

(of imidazole by hypobromous acid)

IT **13820-83-2P**, Hexaamminecobalt triperchlorate

(formation of, in hydrolysis of cobalt ammine dioxamido complex)

IT 14403-82-8P

(formation of, in oxidn. of cobalt ammine imidazole complex by  
hypobromous acid)

IT 2302-30-9, 4,5-Dibromoimidazole 133349-52-7

(oxidn. of cobalt-coordinated, by bromine in presence of acetate  
followed by hydrolysis)

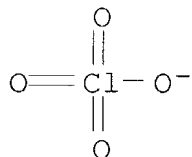
- IT 2034-22-2, 2,4,5-Tribromoimidazole  
(oxidn. of, by bromine followed by hydrolysis)
- IT 132439-25-9 133349-53-8 133349-57-2  
(oxidn. of, by bromine in presence of acetate followed by hydrolysis)
- IT 15279-15-9, Pentaammineimidazolecobalt triperchlorate  
(oxidn. of, by hypobromous acid)
- IT 288-32-4, Imidazole, reactions  
(oxidn. or ring cleavage of cobalt-coordinated, by bromine or hypobromous acid followed by hydrolysis)
- IT 133349-54-9P 133349-66-3P  
(prepn. and crystal structure of)
- IT 133349-56-1P  
(prepn. and hydrolysis of)
- IT 27427-52-7P  
(prepn. and kinetics of hydrolysis and metathetical reaction of, with lithium chloride)
- IT 133349-62-9P  
(prepn. and kinetics of hydrolysis of)
- IT 133349-61-8P  
(prepn. and metathetical reaction of, with sodium dithionate)
- IT 133349-65-2P  
(prepn. and metathetical reaction of, with sodium triflate)
- IT 120-89-8P, Parabanic acid 133349-59-4P 133349-60-7P  
133349-63-0P  
(prepn. of)
- IT 13820-81-0, Pentaammineaquacobalt triperchlorate  
(reaction of, with urea)
- L34 ANSWER 5 OF 9 HCA COPYRIGHT 2004 ACS on STN
- 105:237287 Synthesis and characterization of binuclear and trinuclear cobalt(III) complexes with imidazolate bridges. Hawkins, Clifford J.; Horn, Ernst; Martin, Jill; Palmer, Judith A. L.; Snow, Michael R. (Dep. Chem., Univ. Queensland, St. Lucia, 4067, Australia). Australian Journal of Chemistry, 39(8), 1213-20 (English) 1986. CODEN: AJCHAS. ISSN: 0004-9425.
- AB [(H3N)5CoLCo(NH3)5]5+ and [(NH3)4Co(LCo(NH3)5)2]7+ (I) (HL = imidazole) were prepd. and characterized by electronic absorption spectra, 1H, 13C, 59Co NMR spectra, and electrochem. data. In I the 2 pentaammineimidazolatocobalt(III) units are coordinated in the cis arrangement to tetraamminecobalt(III). The crystal structure of cis-[(NH3)4Co(LCo(NH3)5)2]Cl2(S2O6)2(OH).3.5H2O is reported. The crystals in the form of orange needles are monoclinic: space group Cc, a 20.18(1), b 17.089(9), c 15.395(7) Å, β 123.76(4)°, Z = 4. The structure was refined to R 0.079.
- IT 13820-83-2P  
(prepn. of)
- RN 13820-83-2 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, triperchlorate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-73-0

CMF Cl O4

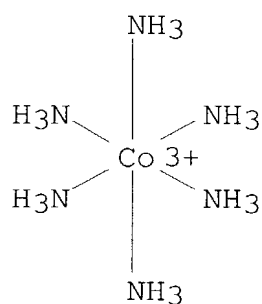


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



CC 78-7 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 72, 75

ST cobalt ammine imidazole polynuclear; crystal structure cobalt imidazole trinuclear; structure cobalt imidazole ammine trinuclear; electrochem cobalt imidazole ammine polynuclear; NMR cobalt imidazole ammine polynuclear

IT Transfer coefficient  
(in polarog. redn. of cobalt ammine imidazole complexes)

IT Nuclear magnetic resonance  
(of carbon-13 and hydrogen in cobalt ammine imidazole binuclear and trinuclear complexes)

IT Reduction, electrochemical  
(of cobalt ammine imidazole complexes on mercury)

IT Crystal structure  
Molecular structure

(of cobalt ammine imidazole-bridged trinuclear complex)  
IT 105225-60-3 105453-46-1  
(NMR of)  
IT 38716-02-8 61159-81-7 105225-58-9 105225-59-0  
(polarog. redn. and NMR of)  
IT 105453-48-3P  
(prepn. and crystal structure of)  
IT **13820-83-2P** 105367-03-1P 105456-04-0P  
(prepn. of)  
IT 61159-82-8  
(reaction of, with pentaammine(dimethylsulfoxide)cobalt  
perchlorate in DMSO)  
IT 51667-94-8  
(reaction of, with pentaammine(imidazolato)cobalt perchlorate in  
DMSO)  
IT 14695-95-5  
(redn. of, polarog.)

L34 ANSWER 6 OF 9 HCA COPYRIGHT 2004 ACS on STN

94:75907 Labile (trifluoromethanesulfonato)cobalt(III) amine complexes.  
Dixon, Nicholas E.; Jackson, W. Gregory; Lancaster, Martin J.;  
Lawrance, Geoffrey A.; Sargeson, Alan M. (Res. Sch. Chem.,  
Australian Natl. Univ., Canberra, 2600, Australia). Inorganic  
Chemistry, 20(2), 470-6 (English) 1981. CODEN: INOCAJ. ISSN:  
0020-1669.

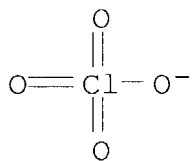
AB Facile synthetic routes to Co(III) amine complexes of the labile  
unidentate trifluoromethanesulfonate anion,  $\text{Co}(\text{NH}_3)_5(\text{OSO}_2\text{CF}_3)_2^+$ ,  
 $\text{cis-Co}(\text{en})_2(\text{OSO}_2\text{CF}_3)_2^+$ , and  $\text{fac-Co}(\text{dien})(\text{OSO}_2\text{CF}_3)_3$  (dien =  
diethylenetriamine) are reported. The use of these complexes as  
synthetic precursors for a range of complexes involving direct  
solvolysis or reactions in poorly coordinating solvents such as  
sulfolane or  $\text{Me}_2\text{CO}$  is described. Syntheses of  $\text{Co}(\text{NH}_3)_5\text{Ln}^+$  ( $\text{L} = \text{OH}_2$ ,  
 $\text{NH}_3$  MeOH, EtOH, iso-PrOH, MeCN,  $\text{OP}(\text{OMe})_3$ , DMF,  $\text{Me}_2\text{SO}$ , urea,  $\text{NCNH}_2$ ,  
 $\text{AcO}^-$ ,  $\text{Cl}_2\text{CHCO}_2^-$ ) in high yield are reported. The kinetics and the  
stereochem. course of aquation of the labile  
trifluoromethanesulfonato complexes and derivs. are reported.

IT **13820-83-2P**  
(prepn. of, from cobalt trifluoromethanesulfonato complex)  
RN 13820-83-2 HCA  
CN Cobalt(3+), hexaammine-, (OC-6-11)-, triperchlorate (9CI) (CA INDEX  
NAME)

CM 1

CRN 14797-73-0

CMF Cl 04

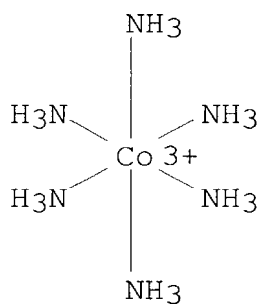


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



- CC 78-7 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 67
- ST fluoromethanesulfonato cobalt amine synthetic precursors; kinetics  
aquation cobalt trifluoromethanesulfonate complex
- IT Kinetics of aquation  
(of cobalt trifluoromethanesulfonato complexes)
- IT Ammines  
(cobalt, with trifluoromethanesulfonato ligands)
- IT 14781-34-1 14877-87-3  
(nitrosation of, in acetonitrile)
- IT 75522-50-8P  
(prepn. and use as precursor in prepn. of other cobalt ammine complexes)
- IT 75522-52-0P 75522-53-1P  
(prepn. and use as precursor in prepn. of other cobalt complexes)
- IT 75522-69-9P  
(prepn. of)
- IT 75557-19-6P  
(prepn. of, by nitrosation of azido complex in acetonitrile soln.)
- IT 13820-81-0P **13820-83-2P** 14096-70-9P 14523-28-5P  
14781-36-3P 15041-41-5P 27427-53-8P 75522-54-2P 75522-55-3P

75522-57-5P 75522-58-6P 75522-59-7P 75522-60-0P 75522-61-1P  
 75522-63-3P 75522-65-5P 75557-17-4P  
 (prepn. of, from cobalt trifluoromethanesulfonato complex)  
 IT 75522-67-7P 75522-71-3P  
 (prepn. of, from trifluoromethanesulfonato complex)  
 IT 13859-51-3 14040-32-5 14040-33-6 14215-59-9 15842-50-9  
 75522-66-6  
 (reaction of, with trifluoromethanesulfonic acid)  
 IT 46145-85-1 75522-68-8  
 (visible spectrum of)

L34 ANSWER 7 OF 9 HCA COPYRIGHT 2004 ACS on STN

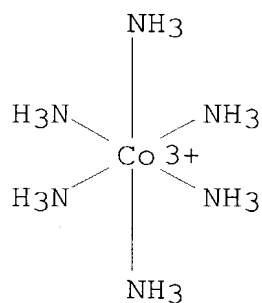
83:125449 Products of the reaction of aquapentaamminecobalt(III) ions with ethylenediamine in dimethyl sulfoxide. Ogino, Hiroshi; Tanaka, Nobuyuki (Tohoku Univ., Sendai, Japan). Chemistry Letters (7), 687-90 (English) 1975. CODEN: CMLTAG. ISSN: 0366-7022.

AB From the products of the reaction of  $[\text{Co}(\text{H}_2\text{O})(\text{NH}_3)_5](\text{ClO}_4)_3$  with ethylenediamine (en) in  $\text{Me}_2\text{SO}$ ,  $[\text{Co}(\text{NH}_3)_5(\text{enH})]\text{Br}_4$  and  $[\text{Co}(\text{NH}_3)_6-2n(\text{en})n]\text{X}_3$  ( $n = 0, 1, 2$ , and  $3$ ) were isolated. Treatment of  $[\text{Co}(\text{NH}_3)_5(\text{enH})]\text{Br}_4$  with aq.  $\text{NH}_3$  gave a novel complex,  $[\text{Co}(\text{NH}_3)_5(\text{en})]\text{Br}_3$  contg. a monodentate en ligand.

IT 10534-85-7P  
 (prepn. in dimethyl sulfoxide soln.)

RN 10534-85-7 HCA

CN Cobalt(3+), hexaammine-, tribromide, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3  $\text{Br}^-$

CC 78-7 (Inorganic Chemicals and Reactions)

ST cobalt ammine reaction ethylenediamine sulfoxide; methyl sulfoxide solvent cobalt ammine; amine cobalt complex soln sulfoxide

IT Cobalt, ammine polyamine complexes  
 (prepn. of, in dimethyl sulfoxide soln.)



- IT **10534-85-7P** 14096-77-6P 14883-80-8P 20745-83-9P  
56566-35-9P  
(prepn. in dimethyl sulfoxide soln.)
- IT 56602-11-0P  
(prepn. of)
- IT 78-90-0 109-76-2 109-81-9 110-60-1 1121-22-8 2783-17-7  
(reaction with pentaammineaquacobalt triperchlorate in dimethyl  
sulfoxide soln.)
- IT 13820-81-0  
(reactions with diamines in dimethyl sulfoxide soln.)
- IT 107-15-3, reactions  
(with cobalt ammine in dimethylsulfoxide)

L34 ANSWER 8 OF 9 HCA COPYRIGHT 2004 ACS on STN

72:128231 Ammonolysis of hexamminecobalt(III) ions in liquid ammonia.  
Schmitz-DuMont, Otto; Hadiwirjatmo, Rachman S. (Anorg.-Chem. Inst.,  
Univ. Bonn, Bonn, Fed. Rep. Ger.). Zeitschrift fuer Anorganische  
und Allgemeine Chemie, 374(1), 35-42 (German) 1970. CODEN: ZAACAB.  
ISSN: 0044-2313.

GI For diagram(s), see printed CA Issue.

AB [Co(NH3)6](NO3)3 in liq. NH3 reacts with KNH2 to form a trinuclear  
Co(III) complex (I) contg. bridging amide groups and  
di-μ-amido-bis[tetraamminecobalt(III)] nitrate (II). I was  
cleaved with HOAc-Na2SO4 to give [(H3N)4Co(NH2)2Co(NH3)3H2O](SO4)2.2  
H2O (III) and [C3(NH3)6](NO3)3. III was converted to II, which gave  
trans-[Co(NH3)4Cl2]Cl when treated with HCl and H2SO4. The  
ammonolysis of [Co(NH3)6](NO3)3 corresponds to the hydrolysis of  
hexaquocomplexes of trivalent cations.

IT **10534-86-8P**

(prepn. of)

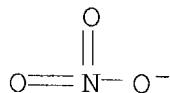
RN 10534-86-8 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, trinitrate (9CI) (CA INDEX  
NAME)

CM 1

CRN 14797-55-8

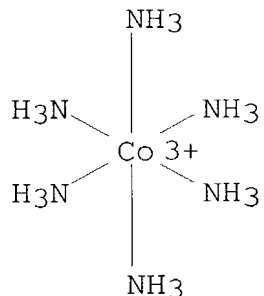
CMF N 03



CM 2

CRN 14695-95-5

CMF Co H18 N6  
CCI CCS

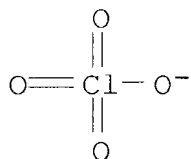


- CC 78 (Inorganic Chemicals and Reactions)  
ST cobalt ammine complexes bridged amides; ammonolysis Co ammine complexes; ammine Co complexes bridged amides; bridged amides Co ammine complexes; amides bridged Co ammine complexes  
IT Ammines  
(cobalt)  
IT **10534-86-8P** 13820-60-5P 20767-83-3P 20767-84-4P  
28288-72-4P  
(prepn. of)
- L34 ANSWER 9 OF 9 HCA COPYRIGHT 2004 ACS on STN  
69:64165 Ligand redox studies. II. Formation of cyano complexes by oxidation of captive thiocyanate. Schug, Kenneth; Miniatas, Birute; Sadowski, Anthony J.; Yano, Tairoku; Ueno, Keihei (Illinois Inst. of Technol., Chicago, IL, USA). Inorganic Chemistry, 7(8), 1669-70 (English) 1968. CODEN: INOCAJ. ISSN: 0020-1669.
- AB Solns. contg. 0.005-0.0015M [Co(NH3)5NCS](ClO4)2 (I), 0.25M H2SO4, and excess Ce(SO4)2 were allowed to react for several weeks at room temp.; the final solns. were treated with H2O2 and passed through an ion exchange resin column to give [Co(NH3)5CN]2+ and [Co(NH3)6]3+ which were identified on the basis of elemental anal., ir, uv, and visible absorption spectra. Oxidn. of aq. I with excess Na2S2O8 in acidic solns. (0.1M) produces [Co(NH3)6]3+ quant. At lower acidities, [Co(NH3)5CN]2+ was present. The product of the oxidn. of [PdL(NCS)]+ (L = tetraethyldiethylenetriamine) and its thiocyanate analog with H2O2 in approx. neutral soln. was identified as [PdL(CN)]+, on the basis of soln. spectral studies.
- IT **13820-83-2P**  
(formation of, in oxidn. of pentaammine(isothiocyanato)cobalt(2+) diperchlorate)  
RN 13820-83-2 HCA  
CN Cobalt(3+), hexaammine-, (OC-6-11)-, triperchlorate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-73-0

CMF Cl O4

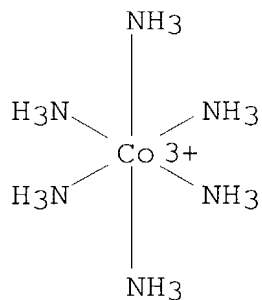


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



CC 78 (Inorganic Chemicals and Reactions)

ST ligands redox; thiocyanate complexes oxidn; cyano complexes prodn

IT Ammines

(cobalt, oxidn. of isothiocyanato ligand to cyano ligand in)

IT Diethylenetriamine, 1,1,7,7-tetraethyl-, palladium complexes

(oxidn. of isothiocyanato and thiocyanato ligands in, to cyano ligands)

IT 20833-17-4P

(formation of, in oxidn. of its isothiocyanato and thiocyanato analogs)

IT **13820-83-2P** 14216-98-9P

(formation of, in oxidn. of pentaammine(isothiocyanato)cobalt(2+) diperchlorate)

IT 302-04-5, reactions

(oxidn. of, as nitrogen-bonded ligand in cobalt and palladium complexes)

IT 15663-42-0

(oxidn. of, formation of hexaamminecobalt(3+) and

pentaamminecobalt(2+) in)  
IT 17549-33-6 17787-29-0  
(oxidn. of, formation of its cyano analog in)

=> d 135 1-30 cbib abs hitstr ind

L35 ANSWER 1 OF 30 HCA COPYRIGHT 2004 ACS on STN

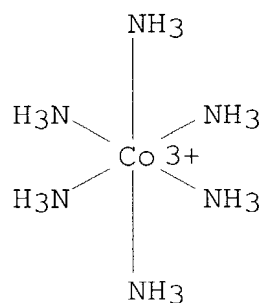
134:369703 Purification of cobalt solutions by ion exchange. Singh, Raj P. (OSRAM SYLVANIA, Chemicals Research and Development, Towanda, PA, 14848, USA). EPD Congress 2001, Proceedings of Sessions and Symposia [of] TMS Annual Meeting, New Orleans, LA, United States, Feb. 11-15, 2001, 675-680. Editor(s): Taylor, Patrick R. Minerals, Metals & Materials Society: Warrendale, Pa. (English) 2001. CODEN: 69BEDN.

AB Lewatit TP207, a chelating resin with iminodiacetate functional group, is used for the purifn. of cobalt hexammine chloride soln. for divalent cationic impurities. The method is employed at com. scale in OSRAM SYLVANIA Inc. cobalt chem. prodn. since 1992. It is obsd. that after long use in the purifn. of cobalt hexammine chloride soln., a large no. of resin beads turn black from their original beige color. The purpose of this paper was to characterize these black-colored resin beads for their ion exchange behavior. The resin sample used in this work was an exhausted prodn. TP207 resin contg. large no. of black-colored beads. The results indicated that blackened resin beads can be regenerated to almost full capacity and their ion exchange behavior for the purifn. of cobalt hexammine chloride soln. was comparable to the new resin.

IT 10534-89-1P, Cobalt hexammine chloride  
(purifn. of cobalt solns. by ion exchange and ion exchanger  
regeneration)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX  
NAME)



● 3 Cl<sup>-</sup>

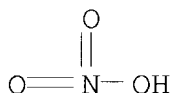
CC 54-2 (Extractive Metallurgy)  
 ST cobalt soln purifn ion exchanger regeneration  
 IT Ion exchange  
     (purifn. of cobalt solns. by ion exchange and ion exchanger  
     regeneration)  
 IT 57285-14-0, Lewatit tp207  
     (purifn. of cobalt solns. by ion exchange and ion exchanger  
     regeneration)  
 IT **10534-89-1P**, Cobalt hexammine chloride  
     (purifn. of cobalt solns. by ion exchange and ion exchanger  
     regeneration)

L35 ANSWER 2 OF 30 HCA COPYRIGHT 2004 ACS on STN  
 128:194415 Metal complexes for use as gas generants for inflation of  
 airbags. Lund, Gary K. (Thiokol Corporation, USA; Lund, Gary K.).  
 PCT Int. Appl. WO 9806486 A2 19980219, 97 pp. DESIGNATED STATES: W:  
 AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK,  
 EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
 LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,  
 SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW,  
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH,  
 CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE,  
 NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO  
 1997-US12565 19970725. PRIORITY: US 1996-22645 19960725; US  
 1997-899599 19970724.

AB Metal complexes are used as gas generating compns. These complexes  
 are comprised of a metal cation template, a neutral ligand contg.  
 hydrogen and nitrogen, and sufficient oxidizing anion to balance the  
 charge of the complex, e.g., hexaamminecobalt(III) nitrate. Such  
 complexes include metal nitrite amines, metal nitrate amines, and  
 metal perchlorate amines, as well as similar hydrazine complexes.

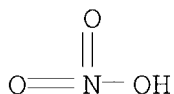
The complexes are used in mixts. with  $\geq 1$  cool burning org. nitrogen-contg. compd., e.g., guanidine nitrate. Nitrogen gas and water vapor are produced when the complex combusts. A binder, e.g., guar gum, and co-oxidizer, e.g., basic copper nitrate, can be combined with the metal complexes to improve crush strength of the gas generating compns. and to permit efficient combustion of the binder. The gas generating compns. are used for inflation of automobile airbags.

IT 6484-52-2, Ammonium nitrate, uses  
10141-05-6, Cobalt dinitrate  
(co-oxidizer; metal complexes as gas generants for airbags)  
RN 6484-52-2 HCA  
CN Nitric acid ammonium salt (8CI, 9CI) (CA INDEX NAME)



● NH<sub>3</sub>

RN 10141-05-6 HCA  
CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)

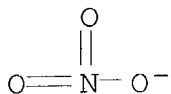


● 1/2 Co(II)

IT 10534-86-8 13820-83-2  
(metal complexes as gas generants for airbags)  
RN 10534-86-8 HCA  
CN Cobalt(3+), hexaammine-, (OC-6-11)-, trinitrate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-55-8  
CMF N O3

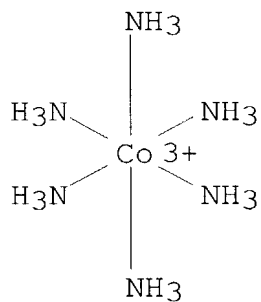


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



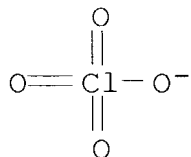
RN 13820-83-2 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, triperchlorate (9CI) (CA INDEX NAME)

CM 1

CRN 14797-73-0

CMF Cl O4

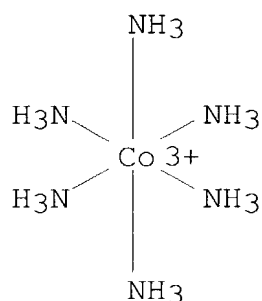


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



- IC ICM B01J  
 CC 50-1 (Propellants and Explosives)  
 Section cross-reference(s): 59  
 ST pyrotechnic compn metal complex airbag inflation  
 IT Polyamides, uses  
 (binder/igniter; metal complexes as gas generants for airbags)  
 IT Gums and Mucilages  
 (binder; metal complexes as gas generants for airbags)  
 IT Airbags (protective)  
 Gas generators  
 Pyrotechnic compositions  
 (metal complexes as gas generants for airbags)  
 IT Ammine complexes  
 Carbon black, uses  
 Coordination compounds  
 (metal complexes as gas generants for airbags)  
 IT 79-06-1D, Acrylamide, derivs., polymers 79-10-7D, Acrylic acid,  
 derivs., polymers 9000-30-0, Guar gum 9003-05-8, Polyacrylamide  
 9004-70-0, Nitrocellulose 25213-24-5, Vinylacetate-vinylalcohol  
 copolymer  
 (binder; metal complexes as gas generants for airbags)  
 IT 1304-76-3, Bismuth oxide Bi2O3, uses 1307-86-4, Cobalt hydroxide  
 Co(OH)3 1308-04-9, Cobalt oxide Co2O3 1308-06-1, Cobalt oxide  
 Co3O4 1308-64-1, Gerhardtite 1309-33-7, Ferric hydroxide  
 1309-37-1, Iron oxide Fe2O3, uses 1313-27-5, Molybdenum oxide  
 MoO3, uses 1314-11-0, Strontium oxide, uses 1317-38-0, Copper  
 oxide CuO, uses 1319-53-5, Malachite 3251-23-8, Copper dinitrate  
 5892-10-4, Bismuth carbonate oxide (Bi2(CO3)O2) **6484-52-2,**  
**Ammonium nitrate, uses 10141-05-6,**  
 Cobalt dinitrate 10377-60-3, Magnesium dinitrate 12011-79-9  
 12052-28-7, Cobalt iron oxide CoFe2O4 12054-48-7, Nickel hydroxide  
 12158-75-7, Copper hydroxide nitrate (Cu2(OH)3(NO3)) 12207-62-4,  
 Manganese hydroxide oxide Mn(OH)3O 12259-21-1, Ferric oxide  
 hydrate 13473-90-0, Aluminum nitrate 13520-71-3 13565-96-3,  
 Bismuth molybdenum oxide Bi2MoO6 14807-97-7 15478-82-7,  
 Manganese hydroxide oxide Mn(OH)2O 15684-40-9 20427-58-1, Zinc



- hydroxide 20427-59-2, Copper hydroxide 21041-93-0, Cobalt hydroxide  $\text{Co}(\text{OH})_2$  22650-91-5, Tin dioxide hydrate 29135-91-9, Molybdenum trioxide hydrate 51839-24-8 54597-01-2, Cobalt hydroxide nitrate  $(\text{Co}_2(\text{OH})_3(\text{NO}_3))$  54652-64-1, Zinc hydroxide nitrate  $(\text{Zn}_2(\text{OH})_3(\text{NO}_3))$  67620-94-4, Cobalt copper hydroxide nitrate  $(\text{CoCu}(\text{OH})_3(\text{NO}_3))$  88878-23-3 108929-66-4, Manganese hydroxide nitrate  $(\text{Mn}(\text{OH})_2(\text{NO}_3))$  117448-98-3 120114-08-1 143047-32-9, Copper zinc carbonate hydroxide  $(\text{Cu}_{1.54}\text{Zn}_{0.46}(\text{CO}_3)(\text{OH})_2)$  143311-87-9, Iron carbonate hydroxide  $(\text{Fe}(\text{CO}_3)_{0.12}(\text{OH})_{2.76})$  147207-47-4, Cobalt iron carbonate hydroxide  $(\text{Co}_{0.69}\text{Fe}_{0.34}(\text{CO}_3)_{0.2}(\text{OH})_2)$  162143-30-8, Bismuth magnesium carbonate hydroxide  $(\text{Bi}_2\text{Mg}(\text{CO}_3)_2(\text{OH})_4)$  162143-31-9, Cobalt copper carbonate hydroxide  $(\text{Co}_{0.49}\text{Cu}_{0.51}(\text{CO}_3)_{0.43}(\text{OH})_{1.1})$  203641-80-9, Cobalt hydroxide oxide  $(\text{Co}(\text{OH})_2\text{O})$  203641-81-0, Iron hydroxide oxide  $(\text{Fe}(\text{OH})_2\text{O})$   
 (co-oxidizer; metal complexes as gas generants for airbags)  
 IT 7439-95-4, Magnesium, uses 7440-42-8, Boron, uses 7757-79-1, Potassium nitrate, uses 10042-76-9, Strontium nitrate  
 (igniter; metal complexes as gas generants for airbags)  
 IT 7727-37-9, Nitrogen, uses  
 (metal complexes as gas generants for airbags)  
 IT 121-82-4, RDX 302-01-2D, Hydrazine, complexes, uses 506-93-4, Guanidine nitrate 1314-62-1, Vanadium oxide ( $\text{V}_2\text{O}_5$ ), uses 7789-78-8, Calcium dihydride **10534-86-8** 13600-88-9 13600-89-0 13600-94-7 13600-97-0 **13820-83-2** 13841-83-3 14404-36-5 15244-74-3 16774-21-3 18918-86-0 19395-00-7 59245-94-2 82434-32-0  
 (metal complexes as gas generants for airbags)  
 IT 7440-44-0, Carbon, uses  
 (powd.; metal complexes as gas generants for airbags)  
 IT 7732-18-5, Water, uses  
 (vapor; metal complexes as gas generants for airbags)

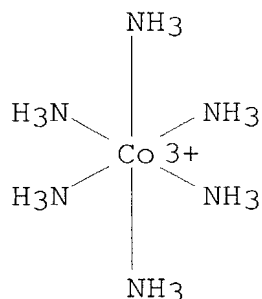
L35 ANSWER 3 OF 30 HCA COPYRIGHT 2004 ACS on STN

119:82748 Photocatalytic effects of halogenpentaamminecobalt(III) complexes on hydrogen peroxide photolysis. Lunak, Stanislav; Sedlak, Petr; Lederer, Pavel (Institute of Inorganic Chemistry, Academy of Sciences of Czech Republic, Pelleova 24, Praha, 160 00/6, Czech.). Journal of Photochemistry and Photobiology, A: Chemistry, 72(2), 169-72 (English) 1993. CODEN: JPPCEJ. ISSN: 1010-6030.

AB The effects of  $[\text{CoIII}(\text{NH}_3)_5\text{L}]\text{An}$  compds. ( $\text{L} = \text{NH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{F}^-$ ,  $\text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{I}^-$ ,  $\text{CO}_3^{2-}$ ;  $\text{A} = \text{Cl}^-$ ,  $\text{Br}^-$ ,  $\text{I}^-$ ,  $\text{NO}_3^-$ ;  $n = 1-3$ ) on the thermal decompn. and photolysis of  $\text{H}_2\text{O}_2$  ( $\lambda_{\text{irr}} = 365 \text{ nm}$ ) were studied. Complexes contg. the fluoride anion are almost inactive in terms of their catalytic/photocatalytic effects, whereas those contg. the iodide anion catalyze the thermal reaction effectively. The  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$  and  $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{Br}_2$  complexes show significant photocatalytic effects including an autocatalytic

reaction and a marked post-irradn. effect. The photocatalytic activity is explained by the photochem. redn. of the central ion and the subsequent formation of the peroxo complexes of the  $[\text{CoII}(\text{NH}_3)_5\text{O}_2\text{CoII}(\text{NH}_3)_5]^{4+}$  type.

IT 10534-89-1  
 (photocatalytic effects of, in photolysis of hydrogen peroxide)  
 RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3  $\text{Cl}^-$

IT 1336-21-6, Ammonium hydroxide  
 7646-79-9, Cobalt chloride, properties  
 (thermal decompn. and photolysis of hydrogen peroxide in presence of)  
 RN 1336-21-6 HCA  
 CN Ammonium hydroxide  $((\text{NH}_4)(\text{OH}))$  (9CI) (CA INDEX NAME)

$\text{H}_4\text{N}-\text{OH}$

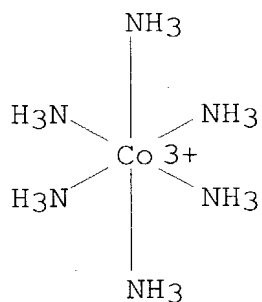
RN 7646-79-9 HCA  
 CN Cobalt chloride  $(\text{CoCl}_2)$  (8CI, 9CI) (CA INDEX NAME)

$\text{Cl}-\text{Co}-\text{Cl}$

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 Section cross-reference(s): 67  
 ST photocatalyst halogenpentaamminecobalt complex hydrogen peroxide  
 photolysis; cobalt ammine halo photocatalyst hydrogen peroxide  
 IT Photolysis catalysts

- (halogenpentaamminecobalt(III) complexes as, in photolysis of hydrogen peroxide)
- IT Reduction, photochemical  
(of halogenpentaamminecobalt(III) complexes, in photolysis of hydrogen peroxide)
- IT Photolysis  
(of hydrogen peroxide, photocatalytic effects of halogenpentaamminecobalt(III) complexes in)
- IT Catalysts and Catalysis  
(photochem., halogenpentaamminecobalt(III) complexes as, for hydrogen peroxide)
- IT Electron exchange and Charge transfer  
(photochem., in halogenpentaamminecobalt(III) complexes, in photolysis of hydrogen peroxide)
- IT **10534-89-1** 13600-92-5 13859-51-3 14240-02-9  
14283-12-6 14404-37-6 15244-74-3 21336-66-3 36395-86-5  
(photocatalytic effects of, in photolysis of hydrogen peroxide)
- IT 7722-84-1, Hydrogen peroxide, reactions  
(photolysis of, photocatalytic effects of halogenpentaamminecobalt(III) complexes on)
- IT **1336-21-6, Ammonium hydroxide**  
7447-40-7, Potassium chloride, properties 7553-56-2, Iodine, properties **7646-79-9, Cobalt chloride**, properties 7681-11-0, Potassium iodide, properties 23103-43-7  
(thermal decompn. and photolysis of hydrogen peroxide in presence of)
- IT 7758-02-3, Potassium bromide, properties 7789-23-3, Potassium fluoride  
(thermal decompn. and photolysis of hydrogen peroxide in presence of)
- L35 ANSWER 4 OF 30 HCA COPYRIGHT 2004 ACS on STN  
118:9693 Purification of cobalt for manufacture powders free of divalent cationic impurities. Miller, Michael J.; Wolfe, Thomas A.; Cheresnowsky, Michael J.; Kim, Tai K. (GTE Products Corp., USA). U.S. US 5154757 A 19921013, 4 pp. (English). CODEN: USXXAM. APPLICATION: US 1991-783752 19911028.
- AB Crude Co contg. heavy-metal and divalent impurities (esp. Cd, Mg, and/or Ca) is processed to prep. **aq.**  $\text{Co}(\text{NH}_3)_6\text{Cl}_3$  soln. for intermediate purifn. by cation-exchange resin to remove the divalent metal impurities. The purified  $\text{Co}(\text{NH}_3)_6\text{Cl}_3$  soln. is then adjusted to pH 12.5-13 for dissocn., and the resulting oxide ppt. is conventionally reduced to manuf. Co powder. The purifn. process using Lewatit TP-207 resin in  $\text{NH}_4^+$  form is suitable for removal of typically 98.5 Ca, 99.4 Mg, and 98.8% Cd. The high-purity Co powder can be manufd. using scrap feed dissolved in HCl, and is suitable for alloying.
- IT **10534-89-1P**

(purifn. of, by cation exchange, removal of divalent metals by)  
 RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

IC ICM B22F009-00  
 ICS C22B023-00  
 NCL 075365000  
 CC 54-3 (Extractive Metallurgy)  
 ST cobalt powder manuf scrap purifn; cation exchange cobalt purifn powder; ammine **cobalt chloride** purifn resin  
 IT Waste solids  
 (scrap, cobalt recovery from)  
 IT 57285-14-0D, Lewatit TP-207, ammonium-form  
 (cation exchange with, in removal of divalent metals in manuf. of powd. cobalt)  
 IT 7440-48-4P, Cobalt, preparation  
 (prepn. of powd., purifn. of ammine **cobalt chloride** soln. in)  
 IT 10534-89-1P  
 (purifn. of, by cation exchange, removal of divalent metals by)  
 IT 7439-95-4, Magnesium, miscellaneous 7440-43-9, Cadmium, miscellaneous 7440-70-2, Calcium, miscellaneous  
 (removal of, in manuf. of powd. cobalt)  
 L35 ANSWER 5 OF 30 HCA COPYRIGHT 2004 ACS on STN  
 116:258556 Method for reducing impurities in hexamminecobalt halide compounds. Husted, Eric F.; Miller, Michael J.; Northrop, Shellie K.; Smith, David T. (GTE Products Corp., USA). U.S. US 5102633 A 19920407, 3 pp. (English). CODEN: USXXAM. APPLICATION: US 1991-703211 19910520.  
 AB Impurity levels of Ca, Mg, and/or Si in hexamminecobalt halide

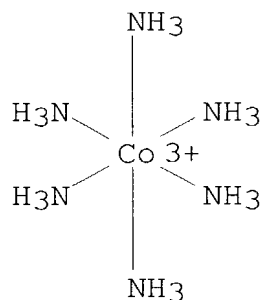
compds., e.g.,  $\text{Co}(\text{NH}_3)_6\text{Cl}_3$ , are reduced by adjusting the pH of an aq. hexamminecobalt halide soln. to  $\geq 9$ , adding sufficient sol. fluoride to the soln. to form insol. fluoride compds. of Mg and/or Ca, adding  $\text{Fe}^{3+}$  ions to form insol. compds. of  $\text{Fe}(\text{OH})_3$  and Si, and filtering the aq. soln. to give a purified aq. hexamminecobalt halide soln.

IT 10534-89-1P

(purifn. of, by removing calcium and magnesium and silicon impurities, method for)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3  $\text{Cl}^-$

IC ICM C01G051-12

NCL 423143000

CC 49-7 (Industrial Inorganic Chemicals)

ST cobalt hexammine chloride purifn; calcium removal hexamminecobalt chloride; magnesium removal hexamminecobalt chloride; silicon removal hexamminecobalt chloride

IT 7681-49-4, Sodium fluoride, uses

(for calcium and magnesium impurity removal, in hexamminecobalt halide purifn.)

IT 7705-08-0, Ferric chloride, uses

(for silicon impurity removal, in hexamminecobalt halide purifn.)

IT 10534-89-1P

(purifn. of, by removing calcium and magnesium and silicon impurities, method for)

IT 7439-95-4, Magnesium, miscellaneous 7440-21-3, Silicon, miscellaneous 7440-70-2, Calcium, miscellaneous (removal of, in hexamminecobalt halide purifn.)

L35 ANSWER 6 OF 30 HCA COPYRIGHT 2004 ACS on STN

115:293550 Preparation and characterization of N,N-bridged and/or S,S-bridged sexidentate-N<sub>2</sub>O<sub>2</sub>S<sub>2</sub> cobalt(III) complexes. Crystal structure of {(3S,8S)-2,2,9,9-tetramethyl-1,10-dithia-4,7-diazacyclotetradecane-3,8-dicarboxylato}cobalt(III) bromide. Okamoto, Kenichi; Fushimi, Norio; Konno, Takumi; Hidaka, Jinsai (Dep. Chem., Univ. Tsukuba, Tsukuba, 305, Japan). Bulletin of the Chemical Society of Japan, 64(9), 2635-43 (English) 1991. CODEN: BCSJA8. ISSN: 0009-2673.

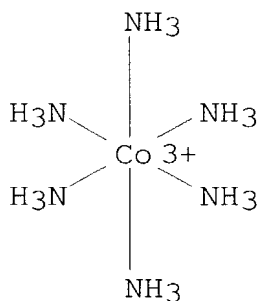
AB Four kinds of cobalt(III) complexes with N,N-bridged, S,S-bridged, or N,N- and S,S-bridged (cyclo type) sexidentate-N<sub>2</sub>O<sub>2</sub>S<sub>2</sub> ligand contg. two D-penicillamine moieties were newly synthesized. Of these complexes, the crystal structure of CoLBr.5.5H<sub>2</sub>O (H<sub>2</sub>L = (3S,8S)-2,2,9,9-tetramethyl-1,10-dithia-4,7-diazacyclotetradecane-3,8-dicarboxylic acid) was detd. by the x-ray diffraction method. The crystal was orthorhombic, space group P2<sub>1</sub>2<sub>1</sub>2<sub>1</sub>, a 16.935(5), b 23.506(7), c 13.057(6) Å, Z = 8, R = 0.0685. The ligand coordinates to the Co atom as the N,N- and S,S-bridged sexidentate-N<sub>2</sub>O<sub>2</sub>S<sub>2</sub>. The abs. configurations of the N and S donor atoms are S(N), S(N) and R(S), R(S), resp. The N,N-bridged five-membered ring is the gauche form with the  $\delta$  conformation and the S,S-bridged seven-membered ring is the twist-chair form with the  $\lambda$  conformation. The other three complexes were characterized by their electronic absorption, <sup>13</sup>C NMR, and CD spectra. The N,N- and/or S,S-bridged complexes showed the characteristic absorption and CD spectral behavior in the region of 16-24 + 103 cm<sup>-1</sup>.

IT 10534-89-1P

(prepn. and reaction of, with ethylenebis(penicillamine))

RN 10534-89-1 HCA

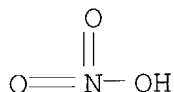
CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



- CC 78-7 (Inorganic Chemicals and Reactions)  
Section cross-reference(s): 75
- ST crystal structure cobalt dithiadiazacyclotetradecanedicarboxylato complex; cobalt ethylenebispenicillaminato dithiadiazacyclotetradecanedicarboxylato complex; azathiacyclotetradecanedicarboxylato cobalt complex; penicillaminato deriv cobalt complex
- IT Circular dichroism  
(of cobalt alkylenebis(penicillaminato) and dithiadiazacyclotetradecanedicarboxylato complexes)
- IT Crystal structure  
Molecular structure  
(of cobalt dithiadiazacyclotetradecanedicarboxylato complex)
- IT 110-52-1, 1,4-Dibromobutane  
(cyclocondensation reaction of, with cobalt-coordinated ethylenebis(penicillamine))
- IT 137376-91-1P 137490-66-5P 137490-67-6P 137694-84-9P  
(prepn. and CD of)
- IT 137376-93-3P  
(prepn. and crystal structure and CD of)
- IT 137525-67-8P, N,N'-Ethylenebis(D-penicillamine)  
(prepn. and cyclocondensation of cobalt-coordinated, with bromobutane)
- IT 137490-69-8P  
(prepn. and mol. structure and CD of)
- IT **10534-89-1P**  
(prepn. and reaction of, with ethylenebis(penicillamine))
- IT 137376-92-2P  
(prepn. and reaction with di-Me sulfate and cyclocondensation reaction of, with bromobutane)
- L35 ANSWER 7 OF 30 HCA COPYRIGHT 2004 ACS on STN
- 115:237631 Cermets for bonding with metals or for forming composites. Kuwabara, Mitsuo (Honda Motor Co., Ltd., Japan). Ger. Offen. DE 3941516 A1 19910620, 32 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1989-3941516 19891215.
- AB The cermets comprise sintered ceramics with interdiffused metal compds. or metal. The cermets are prepd. by pressing powd. mixts. of ceramics or by spray or pressure casting of ceramic slurries, prefiring the green parts, impregnating the prefired parts with a metal salt and/or complex, and by sintering of impregnated parts in an inert or reducing atm. In examples, parts were formed from a powd. mixt. of Si<sub>3</sub>N<sub>4</sub> 90, Y<sub>2</sub>O<sub>3</sub> 5, and Al<sub>2</sub>O<sub>3</sub> 5 wt.%, a powd. mixt. of Si<sub>3</sub>N<sub>4</sub> 84, Y<sub>2</sub>O<sub>3</sub> 7, Al<sub>2</sub>O<sub>3</sub> 4, and ZrO<sub>2</sub> 5 wt.%, and a powd. mixt. of SiC 81.7, Y<sub>2</sub>O<sub>3</sub> 5, Al<sub>2</sub>O<sub>3</sub> 7, ZrO<sub>2</sub> 3, B<sub>4</sub>C 3, and soot 0.3 wt.%. The parts from the 1st mixt. were dipped 1st into boiling satd. aq. Cr(NO<sub>3</sub>)<sub>3</sub> for 5 min and then into boiling satd. aq. Cu(NH<sub>3</sub>)<sub>2</sub>Cl<sub>2</sub>, and the impregnated parts were sintered in

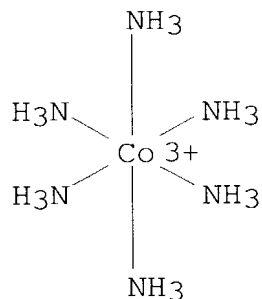
Ar-N atm. at 1700° for 2 h. The parts from the 2nd and 3rd mixts. were dipped 1st into satd. aq. Ni(NO<sub>3</sub>)<sub>2</sub> and Zr(NO<sub>3</sub>)<sub>4</sub> and then into satd. aq. Cr(NO<sub>3</sub>)<sub>3</sub> and Cu chloride complex, and the impregnated parts were embedded in powd. Si<sub>3</sub>N<sub>4</sub> and SiC and sintered in Ar-N atm. at 1700° for 2 h.

IT 10141-05-6, Cobalt dinitrate 10534-89-1  
(impregnation with aq., of prefired ceramic parts, in manuf. of cermets)  
RN 10141-05-6 HCA  
CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



● 1/2 Co(II)

RN 10534-89-1 HCA  
CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

IC ICM C04B041-88  
ICS C04B035-65; C04B035-58; C04B035-10; C04B035-14; C04B035-48;  
C04B035-56; B28B001-00  
ICA F01L003-02; F01L001-46; F01D005-28  
CC 56-4 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 57  
ST cermet manuf metal bonding; composite cermet manuf; silicon nitride cermet manuf; nitride silicon cermet manuf; carbide silicon cermet



manuf; boron carbide cermet manuf; yttria cermet manuf metal bonding; alumina cermet manuf metal bonding; zirconia cermet manuf metal bonding; chromium cermet manuf metal bonding; copper cermet manuf metal bonding

IT Cermets

(manuf. of, for bonding with metals or for forming composite parts)

IT 7550-45-0, Titanium tetrachloride, uses and miscellaneous  
7718-54-9, Nickel dichloride, uses and miscellaneous 7761-88-8,  
Silver nitrate, uses and miscellaneous 10025-73-7, Chromium  
trichloride 10141-05-6, Cobalt dinitrate 10377-66-9,  
Manganese dinitrate 10534-89-1 13138-45-9, Nickel  
dinitrate 13548-38-4, Chromium trinitrate 13746-89-9, Zirconium  
tetranitrate 13860-02-1, Titanium tetranitrate 19410-85-6  
(impregnation with aq., of prefired ceramic parts, in manuf. of  
cermets)

IT 137230-04-7P

(manuf. of)

IT 1314-23-4, Zirconium oxide, uses and miscellaneous 7440-48-4,  
Cobalt, uses and miscellaneous 12069-32-8, Boron carbide  
25583-20-4, Titanium nitride  
(manuf. of cermets contg.)

L35 ANSWER 8 OF 30 HCA COPYRIGHT 2004 ACS on STN

115:125480 Photochemical behavior of metal complexes intercalated in  
zirconium phosphate. Rosenthal, G. L.; Caruso, J. (Dep. Chem.,  
Univ. Vermont, Burlington, VT, 05405, USA). Journal of Solid State  
Chemistry, 93(1), 128-33 (English) 1991. CODEN: JSSCBI. ISSN:  
0022-4596.

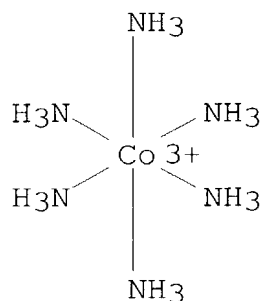
AB Intercalation compds. of  $\alpha$ -Zr(HPO<sub>4</sub>)<sub>2</sub>·H<sub>2</sub>O ( $\alpha$ -ZrP)  
with Cr(NH<sub>3</sub>)<sub>6</sub><sup>3+</sup>, Cr(en)<sub>3</sub><sup>3+</sup> Co(NH<sub>3</sub>)<sub>6</sub><sup>3+</sup>, Co(en)<sub>3</sub><sup>3+</sup>, and Fe(C<sub>5</sub>H<sub>5</sub>)<sub>2</sub><sup>+</sup>  
were prep'd. by aq. ion exchange with (BuNH<sub>3</sub>)<sub>2</sub>Zr(PO<sub>4</sub>)<sub>2</sub>. X-ray powder  
diffraction was used to det. interlayer spacings. Irradn. of  
intercalated Cr(en)<sub>3</sub><sup>3+</sup> with a Hg vapor lamp ( $\lambda_{\text{max}}$  = 254 nm)  
resulted in a red shift of the ligand field absorption max. from 457  
to 560 nm, suggesting loss of all coordinated ethylenediamine and  
substitution by lattice H<sub>2</sub>O and PO<sub>4</sub><sup>3-</sup>. Irradn. of Cr(NH<sub>3</sub>)<sub>6</sub><sup>3+</sup>  
results in a smaller red shift, suggesting kinetic stabilization of  
the ammine complex by inclusion in the phosphate host. The Fe and  
Co complexes do not react under similar photolysis conditions, in  
contrast to their behavior in aq. soln., where reduced complexes  
result. The potential for use of host lattices in stabilization of  
unstable species is discussed.

IT 10534-89-1DP, intercalation reaction product with  
butylammonium zirconium phosphate  
(prepn. of)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX

NAME)

● 3 Cl<sup>-</sup>

- CC 78-3 (Inorganic Chemicals and Reactions)
- ST amine cobalt chromium intercalate zirconium phosphate; photolysis  
transition metal amine intercalate phosphate
- IT Photolysis  
(of chromium amine complexes intercalated into butylammonium  
zirconium phosphate)
- IT 13933-56-7, Zirconium phosphate hydrate (Zr(HPO<sub>4</sub>)<sub>2</sub>·H<sub>2</sub>O)  
(intercalation reaction of, with butylamine)
- IT 10534-89-1 12125-80-3, Ferrocenium 13408-73-6,  
Tris(ethylenediamine)cobalt trichloride 14023-00-8,  
Tris(ethylenediamine)chromium trichloride 15363-28-7  
(intercalation reaction of, with butylammonium phosphate)
- IT 109-73-9, Butylamine, reactions  
(intercalation reaction of, with zirconium phosphate hydrate)
- IT 58973-76-5P  
(prepn. and intercalation reaction of, with transition metal  
amine complexes)
- IT 15363-28-7DP, intercalation reaction product with butylammonium  
zirconium phosphate 58973-76-5DP, intercalation reaction product  
with transition metal complexes  
(prepn. and photolysis of)
- IT **10534-89-1DP**, intercalation reaction product with  
butylammonium zirconium phosphate 12125-80-3DP, Ferrocenium,  
intercalation reaction product with butylammonium zirconium  
phosphate 13408-73-6DP, Tris(ethylenediamine)cobalt trichloride,  
intercalation reaction product with Bu ammonium zirconium phosphate  
14023-00-8DP, Tris(ethylenediamine)chromium trichloride,  
intercalation reaction product with butylammonium zirconium  
phosphate  
(prepn. of)

L35 ANSWER 9 OF 30 HCA COPYRIGHT 2004 ACS on STN

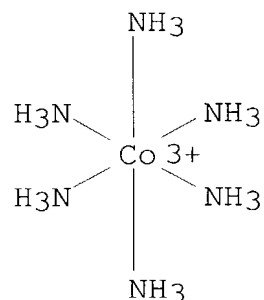
115:124366 Electric properties of chromium(III), cobalt(III), and copper(II) ammine complexes in the solid phase. Grotowska, M.; Wojciechowski, W.; Turkmani, S.; Gubanski, A. (Inst. Inorg. Chem. Metall. Rare Elements, Tech. Univ. Wroclaw, Wroclaw, 50-370, Pol.). Materials Science, 15(4), 71-6 (English) 1989. CODEN: MSCJDS. ISSN: 0137-1339.

AB Elec. properties of polycryst.  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$ ,  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ , and  $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4 \cdot \text{H}_2\text{O}$ , were investigated at 150-300 K. By plotting the  $\ln 1/\sigma$  vs.  $1/T$ , the activation energy was detd. The results are interpreted in terms of MO theory.

IT 10534-89-1, Hexamine cobalt trichloride  
(elec. cond. of)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3  $\text{Cl}^-$

CC 76-1 (Electric Phenomena)

Section cross-reference(s): 78

ST cond ammine complex chromium cobalt copper; MO ammine complex chromium cobalt copper

IT Electric conductivity and conduction  
Molecular orbital

(of chromium and cobalt and copper ammine complexes)

IT Ammines

(chromium, elec. cond. of)

IT Ammines

(cobalt, elec. cond. of)

IT Ammines

(copper, elec. cond. of)

IT 7664-41-7

(ammines, chromium, elec. cond. of)  
 IT 7664-41-7  
 (ammines, cobalt, elec. cond. of)  
 IT 7664-41-7  
 (ammines, copper, elec. cond. of)  
 IT 10380-29-7 **10534-89-1**, Hexaamine **cobalt**  
**trichloride** 13820-25-2, Hexaamine chromium trichloride  
 (elec. cond. of)

L35 ANSWER 10 OF 30 HCA COPYRIGHT 2004 ACS on STN

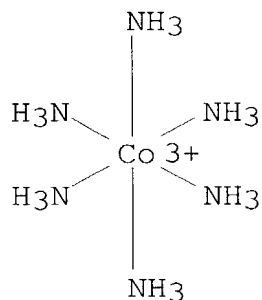
113:190391 Coordination complexes of cobalt: inorganic synthesis in the general chemistry laboratory. Williams, Gregory M.; Olmsted, John, III; Preksa, Andrew P., III (California State Univ., Fullerton, CA, 92634, USA). Journal of Chemical Education, 66(12), 1043-5 (English) 1989. CODEN: JCEDA8. ISSN: 0021-9584.

AB A lab. expt. is described involving the synthesis and spectral studies of a series of  $[\text{Co}(\text{NH}_3)_5\text{L}]$  complexes ( $\text{L} = \text{NH}_3$ ,  $\text{Cl}^-$ ,  $\text{H}_2\text{O}$ ,  $\text{NO}_2^-$ , and  $\text{ONO}^-$ ) that not only gives general chem. students an introduction to inorg. synthesis but also allows them to conduct a systematic study on the effect of different ligands on absorption spectra. The authors warn that the 30%  $\text{H}_2\text{O}_2$  used in the synthesis of  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$  is a strong oxidizing agent that will cause severe burns and bleaching of skin and clothing.

IT **10534-89-1P**  
 (synthesis of, lab. expt. in)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



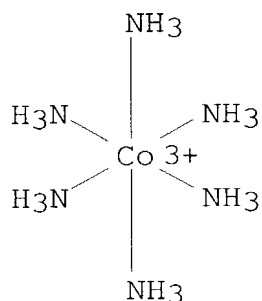
● 3  $\text{Cl}^-$

CC 20-4 (History, Education, and Documentation)

Section cross-reference(s): 78

ST cobalt pentamine complex synthesis lab expt; safety cobalt complex

synthesis expt  
IT Laboratory experiment  
    (in cobalt pentamine complexes synthesis)  
IT Safety  
    (in hydrogen peroxide handling, in cobalt pentamine complexes  
    synthesis lab. expt.)  
IT 7722-84-1, Hydrogen peroxide, reactions  
    (in cobalt complex prepn., in lab. expt.)  
IT 7664-41-7, Ammonia, uses and miscellaneous  
    (in cobalt pentamine complexes prepn., lab. expt. in)  
IT 7791-13-1  
    (reaction of, with ammonia and ammonium chloride and hydrogen  
    peroxide, in lab. expt. in cobalt complex prepn.)  
IT 12125-02-9, Ammonium chloride, reactions  
    (reaction of, with ammonia and **cobalt chloride**  
    and hydrogen peroxide, in lab. expt. in cobalt complex prepn.)  
IT **10534-89-1P** 13782-02-0P 13815-11-7P 13820-80-9P  
    13859-51-3P  
    (synthesis of, lab. expt. in)  
  
L35 ANSWER 11 OF 30 HCA COPYRIGHT 2004 ACS on STN  
103:214180 Hexaammine complexes of chromium(III) and cobalt(III). A  
spectral study. Brown, D. R.; Pavlis, R. R. (Div. Sci. Math., Coll.  
Virgin Islands, St. Thomas, 00802, Virgin I. (U. S.)). Journal of  
Chemical Education, 62(9), 807-8 (English) 1985. CODEN: JCEDA8.  
ISSN: 0021-9584.  
AB An undergraduate coordination chem. expt. is described, involving  
the synthesis and spectral measurements of hexamminecobalt(III)  
chloride and hexaamminechromium(III) nitrate.  
IT **10534-89-1P**  
    (prepn. and spectrum of, lab. expt. in)  
RN 10534-89-1 HCA  
CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX  
NAME)



● 3 Cl<sup>-</sup>

- CC 20-4 (History, Education, and Documentation)  
 Section cross-reference(s): 66
- ST chromium hexaammine complex lab expt; cobalt complex prepn spectra expt
- IT Ultraviolet and visible spectra  
 (of chromium and cobalt hexaammine complexes prepn. and spectra)
- IT **10534-89-1P** 15363-28-7P  
 (prepn. and spectrum of, lab. expt. in)

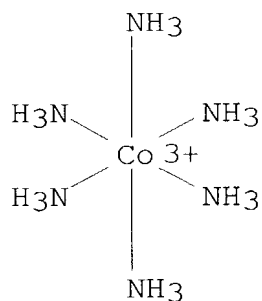
L35 ANSWER 12 OF 30 HCA COPYRIGHT 2004 ACS on STN

99:12844 Electroplating of chromium-cobalt alloys with chemical coloring. Taviere, Jean Andre (Fr.). Fr. Demande FR 2514036 A1 19830408, 7 pp. (French). CODEN: FRXXBL. APPLICATION: FR 1981-18902 19811007.

AB Electroplating with chem. coloring allows one to obtain colored electroplates having an excellent mech. resistance and corrosion resistance with the coatings contg. a combination of a Co(III) complex and a Cr(III) complex, having formulas of Co(NH<sub>3</sub>)<sub>6</sub>Cl<sub>3</sub> and (CrX)<sub>6</sub>Cl<sub>3</sub> (where X is ≥1 ligands selected from H<sub>2</sub>O, NH<sub>3</sub> and CN-), resp. Electrolysis of the combined complex [e.g. (NH<sub>3</sub>)<sub>5</sub>Co(III) - H<sub>2</sub>O - Cr(II)(H<sub>2</sub>O)<sub>5</sub>]4+ is conducted at 20-50° between a Pb anode and a cathode made up of the pieces to be treated in an ammoniacal soln. of CoCl<sub>2</sub> and CrCl<sub>2</sub> in the presence of an active C catalyst. In an example, an alloy of Co and Cr was deposited on a cathode consisting of a stainless steel 18/8 wire in a bath contg.: CoCl<sub>2</sub> 0.2, NH<sub>4</sub>Cl 0.1, NH<sub>3</sub> 0.5 M, and H<sub>2</sub>O<sub>2</sub> 1 g/L in H<sub>2</sub>O 2 L at 35-50°, c.d. 5-20 A/dm<sup>2</sup>, voltage 7-15 V, and with active C present (20 g/L). Before applying any d.c., CrCl<sub>2</sub> 2 and NaCN 6 M were added to the bath. The coating deposited on the wire was a Cr-Co, mat blue-violet alloy of high hardness colored with complexes, not

showing any cracking under strong magnification.

IT **10534-89-1**  
 (in coloring of chromium-cobalt alloy electroplates)  
 RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

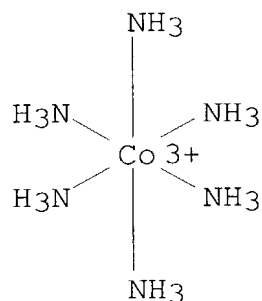
IC C25D009-10; C25D011-14  
 CC 72-8 (Electrochemistry)  
 ST electroplating chem coloring; chromium cobalt alloy colored electroplate  
 IT 11114-92-4  
 (electroplating of, with chem. coloring)  
 IT **10534-89-1** 13820-25-2 13820-87-6 14842-83-2  
 (in coloring of chromium-cobalt alloy electroplates)  
 IT 7722-84-1, uses and miscellaneous  
 (in electroplating of chromium-cobalt alloys with chem. coloring)

L35 ANSWER 13 OF 30 HCA COPYRIGHT 2004 ACS on STN  
 98:219524 Structure and sorption properties of iron(III) hydroxide oxide in processing of Cuban laterite ores. Frades, L. (Khim. Fak., Mosk. Gos. Univ., Moscow, USSR). Deposited Doc., VINITI 575-82, 245-9 Avail. VINITI (Russian) 1981.

AB The sorption of 60Co-labeled [Co(NH3)6]Cl3 by FeOOH at 30° was studied in connection with the undesirable copptn. of Co with the FeOOH during the NH3-carbonate leaching of laterite ores for the recovery of Ni. A model is proposed for the structure of FeOOH primary elements and sorption of [Co(NH3)6]3+ ions based on the dimensional commensurability of the sorbate and sorbent.

IT **10534-89-1P**  
 (sorption of, by iron hydroxide in nickel recovery from laterite ores)

RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

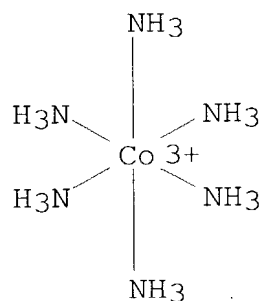
CC 54-2 (Extractive Metallurgy)  
 ST cobalt copptn iron laterite leaching; nickel recovery laterite  
 cobalt loss; iron hydroxide cobalt copptn  
 IT Laterite  
     (nickel recovery from)  
 IT 7440-02-0P, preparation  
     (recovery of, from laterite ores, cobalt loss in)  
 IT 7440-48-4P, preparation  
     (recovery of, from laterite, loss by cobalt pptn. with iron  
     hydroxide in)  
 IT **10534-89-1P**  
     (sorption of, by iron hydroxide in nickel recovery from laterite  
     ores)

L35 ANSWER 14 OF 30 HCA COPYRIGHT 2004 ACS on STN  
 98:52661 The study of a cobalt complex - a laboratory project. Loehlin,  
 James H.; Kahl, Stephen B.; Darlington, Jeanne A. (Wellesley Coll.,  
 Wellesley, MA, 02181, USA). Journal of Chemical Education, 59(12),  
 1048-51 (English) 1982. CODEN: JCEDA8. ISSN: 0021-9584.  
 AB A 2nd-semester undergraduate introductory lab. course, which  
 includes an 8-wk project involving synthesis and qual. and quant.  
 anal. of either Co(NH<sub>3</sub>)<sub>5</sub>Cl<sub>3</sub> or Co(NH<sub>3</sub>)<sub>6</sub>Cl<sub>3</sub>, is described. The  
 prepn., purifn., and anal. give the student experience with  
 synthesis, recrystn., gravimetric anal., and volumetric anal. using  
 both acid-base and redox methods. In addn., experience is gained  
 with qual. anal., detg. an empirical formula from percent compn. by  
 wt., and obtaining theor. and actual yields.  
 IT **10534-89-1P**



(prepn. and qual. and quant. anal. of, semester-long lab. expt. in)

RN 10534-89-1 HCA  
CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

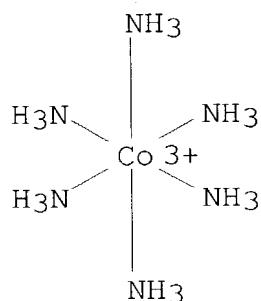
CC 20-4 (History, Education, and Documentation)  
ST lab expt semester project; cobalt complex lab expt  
IT Transition metals, compounds  
(complexes, lab. expt. in, semester-long project of)  
IT Laboratory experiment  
(in transition metal complexes, semester-long project for)  
IT **10534-89-1P** 13859-51-3P  
(prepn. and qual. and quant. anal. of, semester-long lab. expt. in)

L35 ANSWER 15 OF 30 HCA COPYRIGHT 2004 ACS on STN  
97:148306 Cobalt metal powder. Gingerich, Richard G. W.; Scheithauer, Richard A. (GTE Products Corp., USA). U.S. US 4329169 A 19820511, 4 pp. (English). CODEN: USXXAM. APPLICATION: US 1980-179332 19800818.

AB Co fine powder is prepd. by heating aq. cobaltic ammine halide to  $\geq 120^\circ$  to decomp. and form a ppt., then filtration, and redn. by H. Thus, **CoCl<sub>2</sub>** soln. from WC-Co scrap was reacted with **NH<sub>4</sub>OH**, aerated, heated, ppt. settled, filtered off **Co(NH<sub>3</sub>)<sub>5</sub>Cl<sub>2</sub>** and **Co(NH<sub>3</sub>)<sub>6</sub>Cl<sub>3</sub>**, and reduced to fine Co powder by H at .apprx.500°.

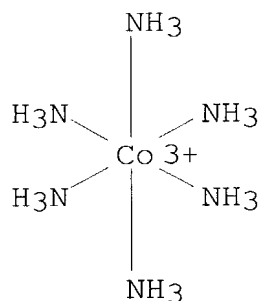
IT **10534-89-1P**  
(formation and decompn. of, in cobalt fine powder prepn.)

RN 10534-89-1 HCA  
CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

- IC B22F009-00  
 NCL 075000500AA  
 CC 54-2 (Extractive Metallurgy)  
 Section cross-reference(s): 77  
 ST cobalt fine powder prepn; ammine chloride cobalt powder  
 IT **10534-89-1P** 14874-58-9P  
 (formation and decompn. of, in cobalt fine powder prepn.)  
 IT 7440-48-4P, preparation  
 (prepn. of fine powd., from cobaltic ammine halides)  
 IT 1333-74-0, reactions  
 (redn. by, in cobalt fine powder prepn.)
- L35 ANSWER 16 OF 30 HCA COPYRIGHT 2004 ACS on STN  
 95:154533 Recovering cobalt. Vanderpool, Clarence D.; MacInnis, Martin  
 B.; McClintic, Robert P.; Gingerich, Richard G. W. (GTE Products  
 Corp., USA). U.S. US 4278463 19810714, 6 pp. (English). CODEN:  
 USXXAM. APPLICATION: US 1980-135050 19800328.
- AB The Co in aq. by-product solns. contg. NH<sub>3</sub> and a halide is recovered  
 by addn. of Al metal to ppt. the Co. Thus, Al was added to the  
 acidic by-product streams from the prepn. of Co(NH<sub>3</sub>)<sub>5</sub>Cl<sub>3</sub>, resulting  
 in the evolution of H gas and formation of black ppt. When sepd. by  
 filtering, the ppt. contained 1 part Co/1000 filtrate at pH 3 or 6,  
 but 0.41 at pH 7. The ppt. was conventionally reduced with H to Co  
 metal powder.
- IT **10534-89-1P**  
 (prepn. of, cobalt recovery in, aluminum for)
- RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX  
 NAME)



● 3 Cl<sup>-</sup>

IC C22B023-04  
 NCL 75-.5A  
 CC 54-2 (Extractive Metallurgy)  
 ST cobalt recovery pptn aluminum; halide ammonia cobalt pptn aluminum  
 IT 7429-90-5, uses and miscellaneous  
     (cobalt recovery by, from waste ammine halide solns.)  
 IT 13859-51-3  
     (cobalt recovery from solns. contg., aluminum addn. for)  
 IT **10534-89-1P**  
     (prepn. of, cobalt recovery in, aluminum for)  
 IT 7440-48-4P, preparation  
     (recovery of, from wastewater contg. ammonia and halide, aluminum  
     addn. for)

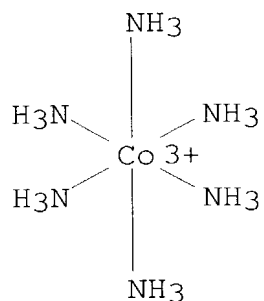
L35 ANSWER 17 OF 30 HCA COPYRIGHT 2004 ACS on STN

93:189878 Cobaltic hexammine compounds and cobalt metal powder.  
 Gingerich, Richard G. W.; McClintic, Robert P. (GTE Products Corp.,  
 USA). U.S. US 4218240 19800819, 5 pp. (English). CODEN: USXXAM.  
 APPLICATION: US 1979-38970 19790514.

AB Co is recovered by treating aq. (leach) solns. contg. NH<sub>3</sub> and Co  
 ions with an acid in the presence of a catalyst, such as activated  
 C, to convert the Co ions to a Co hexammine ion, which is pptd. by  
 addn. of a hydroxide, and the ppt. is reduced to fine Co powder.  
 Thus, 250 mL of a 28% NH<sub>4</sub>OH soln. was mixed with 200 mL of  
 aq. CoCl<sub>2</sub> soln. in 2.8M HCl (contg. 120 Co/L and 0.5-10%  
 other metals) and 4.9 g activated charcoal was added. The mixt. at  
 pH 9.7 was stirred for 7 h at 40°. The suspension was  
 treated with 250 mL of 36% HCl, cooled to 3°, and filtered.  
 A mixt. of yellow hexamminecobalt (III) chloride and charcoal was  
 obtained, washed with 6M HCl, adjusted to pH 8, filtered, treated  
 with 36% HCl, cooled, and filtered to give 98% yield of pure

hexammine cobalt (III) chloride. The product is treated with NaOH at 92° to ppt. Co oxide hydrate, which was filtered and reduced with H at 500° to give Co powder.

IT **10534-89-1P**  
 (prepn. of, from cobalt leach solns.)  
 RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

IC C22B023-04  
 NCL 75-.5AA  
 CC 54-2 (Extractive Metallurgy)  
 ST cobalt recovery ammine prep  
 IT **10534-89-1P**  
 (prepn. of, from cobalt leach solns.)  
 IT 7440-48-4P, preparation  
 (recovery of, from leach solns. by prepn. of hexamminecobalt trichloride and formation of oxide and redn. with hydrogen)

L35 ANSWER 18 OF 30 HCA COPYRIGHT 2004 ACS on STN

89:122118 Complexes of cobalt containing ammonia or ethylenediamine.

Hexaamminecobalt(III) salts. Lindholm, Robert D. (Res. Lab., Eastman Kodak Co., Rochester, NY, USA). Inorganic Syntheses, 18, 67-74 (English) 1978. CODEN: INSYA3. ISSN: 0073-8077.

AB [Co(NH<sub>3</sub>)<sub>6</sub>](OAc)<sub>3</sub> was prepd. by bubbling air and NH<sub>3</sub> into a soln. of Co(OAc)<sub>2</sub> and NH<sub>4</sub>OAc in MeOH contg. activated C; after removal of the C catalyst the product was pptd. by addn. of Me<sub>2</sub>CO. This same procedure, followed by treatment with HCl after catalyst removal, gave [Co(NH<sub>3</sub>)<sub>6</sub>]Cl<sub>3</sub>. Cis-[Co(NH<sub>3</sub>)<sub>4</sub>(NO<sub>2</sub>)<sub>2</sub>]NO<sub>3</sub> was prepd. by reaction of [Co(CO<sub>3</sub>)(NH<sub>3</sub>)<sub>4</sub>]NO<sub>3</sub> with aq. HNO<sub>3</sub> followed by addn. of NaNO<sub>2</sub>. Trans-[Co(NH<sub>3</sub>)<sub>4</sub>(NO<sub>2</sub>)<sub>2</sub>]Cl was prepd. by adding aq. NH<sub>3</sub> and aq. CoCl<sub>2</sub> to a soln. contg.

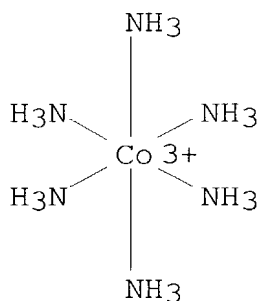
NaNO<sub>2</sub> and NH<sub>4</sub>Cl and then bubbling air through the mixt. Heating an aq. mixt. of trans-[Co(en)<sub>2</sub>(NO<sub>2</sub>)<sub>2</sub>]NO<sub>3</sub> and HCl until NO<sub>2</sub> evolution ceased gave a ppt. of trans-[CoCl<sub>2</sub>(en)<sub>2</sub>]NO<sub>3</sub>.

IT 10534-89-1P

(prepn. of)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

CC 78-7 (Inorganic Chemicals and Reactions)

ST cobalt ammine ethylenediamine nitro complex; safety cobalt nitro ammine

IT Safety

(in cobalt ammine nitro complex sepn.)

IT Ammines

(cobalt)

IT 10534-89-1P 13782-03-1P 13782-04-2P 14023-85-9P  
14587-94-1P

(prepn. of)

L35 ANSWER 19 OF 30 HCA COPYRIGHT 2004 ACS on STN

89:89651 Complexes and their magnetic properties. A curriculum for secondary level II. Mackenroth, Wolfgang; Reinert, Gerd Bodo (Hamburg, Fed. Rep. Ger.). Praxis der Naturwissenschaften, Chemie, 27(5), 128-32 (German) 1978. CODEN: PXNCAP. ISSN: 0342-8737.

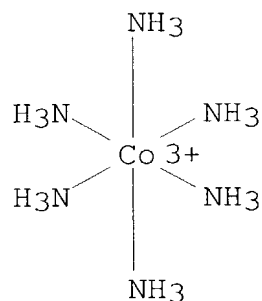
AB A description of metal complexes, esp. their magnetic properties, is given for use in a secondary level II curriculum, based on the examples of [Co(NH<sub>3</sub>)<sub>6</sub>]Cl<sub>3</sub> and [Co(NH<sub>3</sub>)<sub>6</sub>]Cl<sub>2</sub>. The prepn. of these complexes for lab. or lecture demonstrations is described, as well as the electron configuration in the ligand field through measurements of the magnetic moment.

IT 10534-89-1P

(prepn. and magnetic properties of, education in)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)

● 3 Cl<sup>-</sup>

CC 20-3 (History, Education, and Documentation)

ST education metal complex magnetic property; hexamminecobalt chloride  
magnetic property education

IT Education

(in metal complexes and their magnetic properties)

IT Electron configuration

Magnetic property and Magnetism

(of metal complexes, education in)

IT Metals, compounds

(complexes, education in)

IT 10534-89-1P 13874-13-0P

(prepn. and magnetic properties of, education in)

L35 ANSWER 20 OF 30 HCA COPYRIGHT 2004 ACS on STN

88:81784 Insoluble silver/cobalt complex and process for its formation.

White, W. W.; Parmeter, R. R. (UK). Research Disclosure, 164, 39-40  
(English) 1977. CODEN: RSDSBB. ISSN: 0374-4353.

AB An insol. Ag/Co complex, hexaamminecobalt(III)

dithiosulfatoargentate(I), is formed by the reaction of a Ag  
thiosulfate complex and a hexaamminecobalt complex. This reaction  
to form the insol. complex can be advantageously utilized in the  
recovery of Ag, or in the detn. of Ag concn., in aq. solns. contg. a  
Ag thiosulfate complex, such as photog. fixing and bleach-fixing  
solns. contg. a Ag thiosulfate complex, such as photog. fixing and  
bleach-fixing solns. The complex also has bactericidal and  
fungicidal properties. Thus, a com. photog. fixing soln. contg.  
Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> as the fixing agent was used to process films until the

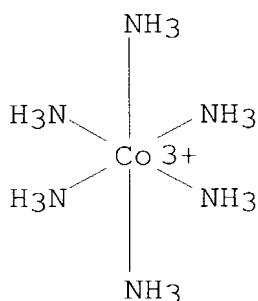
soln. was spent. The concn. of Ag in the spent soln. was detd. by at. absorption anal. and by pptn. of hexaamminecobalt(III) dithiosulfatoargentate(I). Results obtained indicated a Ag concn. of 2.9 g/L in the spent soln. as compared to a value of 2.8 g/L obtained by at. absorption anal.

IT 10534-89-1P

(reaction of, with sodium dithiosulfatoargentate(I) in silver recovery from photog. processing solns.)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

CC 74-2 (Radiation Chemistry, Photochemistry, and Photographic Processes)

Section cross-reference(s): 5, 63

ST hexaamminecobalt dithiosulfatoargentate silver recovery photog; bactericide hexaamminecobalt dithiosulfatoargentate; fungicide hexaamminecobalt dithiosulfatoargentate

IT Photographic processing

(fixing solns. for, silver recovery from, pptn. of hexaamminecobalt(III) dithiosulfatoargentate(I) in)

IT Bactericides, Disinfectants and Antiseptics  
Fungicides and Fungistats

(hexaamminecobalt(III) dithiosulfatoargentate(I) as)

IT 65574-35-8

(bactericide, fungicide, and in recovery of silver from photog. processing solns.)

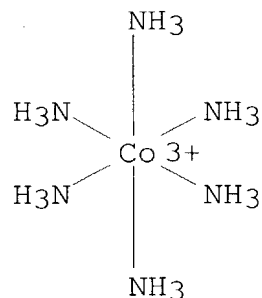
IT 53819-72-0P

(reaction of, with hexaamminecobalt(III) trichloride in silver recovery from photog. processing solns.)

IT 10534-89-1P

(reaction of, with sodium dithiosulfatoargentate(I) in silver

- recovery from photog. processing solns.)
- IT 7440-22-4P, preparation  
(recovery of, from photog. processing solns., pptn. of  
hexaamminecobalt(III) dithiosulfatoargentate(I) in)
- L35 ANSWER 21 OF 30 HCA COPYRIGHT 2004 ACS on STN  
83:186248 Method of incorporating photographic color couplers in  
hydrophilic colloids. Anon. (Kodak Ltd., London, UK). Research  
Disclosure, 136, 24-5 (English) 1975. CODEN: RSDSBB. ISSN:  
0374-4353.
- AB Photographic color couplers contg. sulfonic or carboxylic acid  
groups or their alkali metal or ammonium salts are incorporated into  
hydrophilic colloids by forming an ion pair of the coupler with a  
cationic Co(III) or Cr(III) complex and dispersing the resultant  
solid in a hydrophilic colloid soln. either per se or as a soln. in  
a coupler solvent.
- IT 10534-89-1P  
(photog. color coupler incorporation in hydrophilic colloid by  
formation of ion pair with)
- RN 10534-89-1 HCA
- CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX  
NAME)



● 3 Cl<sup>-</sup>

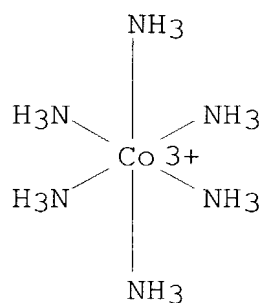
- CC 74-2 (Radiation Chemistry, Photochemistry, and Photographic  
Processes)
- ST color coupler incorporation emulsion; gelatin color coupler  
incorporation
- IT Photographic emulsions  
(color coupler incorporation in, by complex formation with cobalt  
or chromium)
- IT Photographic couplers  
(incorporation of, in hydrophilic colloids, as ion pairs with



- cationic complexes)
- IT 1,3-Benzenedicarboxylic acid, 5-[[4,5-dihydro-4-[[4-  
[(octadecylamino)carbonyl]phenyl]thio]-1-phenyl-1H-pyrazol-3-  
yl]amino]-, anion, ion pair with hexaamminecobalt(III)
- 1,3-Benzenedicarboxylic acid, 5-[ethyl[[1-hydroxy-4-[[[3-(3-  
pentylphenoxy)propyl]amino]carbonyl]phenoxy]-2-  
naphthalenyl]carbonyl]amino]-, anion, ion pair with  
hexaamminecobalt(III)  
(formation of, for incorporation of photog. color coupler in  
hydrophilic colloid)
- IT 5489-37-2  
(dispersion of color coupler, in hydrophilic colloids, as ion  
pair complex with hexaammine cobalt)
- IT 57104-62-8 57116-69-5 57116-70-8  
(dispersion of color coupler, in hydrophilic colloids, as ion  
pair complex with hexaamminecobalt)
- IT 57111-14-5P 57111-16-7P  
(formation of, for incorporation of photog. color coupler in  
hydrophilic colloid)
- IT 10534-89-1P  
(photog. color coupler incorporation in hydrophilic colloid by  
formation of ion pair with)
- L35 ANSWER 22 OF 30 HCA COPYRIGHT 2004 ACS on STN
- 79:11782 Photoelectron spectra induced by x-rays of above 600  
nonmetallic compounds containing 77 elements. Joergensen, Christian  
Klixbull; Berthou, Herve (Den.). Matematisk-Fysiske Meddelelser -  
Kongelige Danske Videnskabernes Selskab, 38(15), 93 pp. (English)  
1972. CODEN: KDVSAB. ISSN: 0023-3323.
- AB The photoelectron spectra induced by Al (1486.6 eV) or Mg (1253.6  
eV) x-ray excitation of >600 compds. indicate that the chem. shift  
(dI) of the ionization energy (I) of the inner shells is not only  
dependent on the oxidn. state of a given element, but also on the  
ligands. Even for a fixed oxidn. state, dI was 2-8 eV in a  
comparative study of all elements which are neither noble gases nor  
strongly radioactive. However, this conclusion is, to some extent,  
modified by reproducible pos. potentials on nonconducting samples  
which were measured at 1-4V in typical cases and compared with the  
theory for almost ionic cubic crystals and with expts. with mixts.  
of nonconducting powd. MgF2, BaSO4, and ThF4 and metals such as Au,  
Tl2O3, and CuS. The widths and highly varying intensities of  
photoelectron signals are theor. discussed. The d and f shells of  
transition and post-transition group atoms give relatively intense  
signals even for I 8-30 eV since the 1486.6-eV photons most readily  
ionize shells with small av. radii. Interesting relations can be  
established with electron transfer spectra and optical  
electronegativities. Special satellites occur in Cu(II), La(III)  
and other lanthanide compds. The adaptation of the electronic d. of

the neighbor atoms in the ionized system contribute to dI which cannot be explained exclusively on the basis of fractional at. charges and the Madelung potential.

IT 10534-89-1P  
 (prepn. of)  
 RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



### ●3 Cl<sup>-</sup>

CC 73-5 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance, and Other Optical Properties)  
 ST photoelectron spectra inorg compd; bonding inorg photoelectron spectra; x ray photoelectron spectra inorg  
 IT Bond  
 (in inorg. compds., x-ray photoelectron spectra in relation to)  
 IT Photoelectron spectra  
 (of inorg. compds., x-ray-induced)  
 IT Nitrosyls  
 Rare earth metals, compounds  
 Transition metals, compounds  
 (photoelectron spectra of)  
 IT Inorganic compounds  
 (photoelectron spectrum of, induced by x-rays)  
 IT Ammines  
 (transition metal, photoelectron spectra of)  
 IT Valence  
 (x-ray photoelectron spectra of inorg. compds. in relation to)  
 IT Antimony oxide (Sb<sub>2</sub>O<sub>3</sub>), solid solns. with tin oxide  
 Cerium oxide (CeO<sub>2</sub>), solid solns. with thorium oxide and uranium oxide  
 Praseodymium oxide (PrO<sub>2</sub>), solid solns. with thorium dioxide  
 Tantalum oxide (Ta<sub>2</sub>O<sub>5</sub>), solid solutions with tungsten oxide

Thorium oxide (ThO<sub>2</sub>), solid solns. with cerium oxide and uranium oxide

Thorium oxide (ThO<sub>2</sub>), solid solns. with praseodymium dioxide

Tin oxide (SnO<sub>2</sub>), solid solns. with antimony oxide

Uranium oxide (UO<sub>2</sub>), solid solns. with cerium oxide and thorium oxide

(photoelectron spectrum of)

IT	61-73-4	64-20-0	68-05-3	75-58-1	143-66-8	147-14-8
	311-28-4	506-61-6	513-78-0	526-78-3	534-16-7	534-17-8
	537-01-9	544-92-3	554-13-2	587-26-8	595-90-4	598-63-0
	632-69-9	814-94-8	1304-56-9, properties		1304-76-3	1306-19-0
	1306-23-6, properties		1306-24-7	1306-38-3	1308-04-9	
	1308-38-9, properties		1308-87-8	1308-96-9	1309-37-1,	
	properties	1309-60-0	1310-53-8	1312-43-2	1312-81-8	
	1313-13-9, properties		1313-27-5, properties		1313-96-8	
	1313-97-9		1313-99-1, properties		1314-06-3	1314-13-2,
	properties	1314-20-1, properties		1314-32-5	1314-36-9	
	1314-37-0	1314-41-6	1314-62-1, properties		1314-64-3	
	1314-87-0	1314-98-3, properties		1317-36-8, properties		
	1317-38-0, properties		1317-40-4	1317-61-9	1343-93-7	
	1344-57-6, properties		1344-59-8	1470-61-7	1661-03-6	
	1923-70-2	2040-52-0	2536-14-3	3087-82-9	3244-41-5	
	3269-10-1	3425-46-5	3866-51-1	4312-27-0	4566-60-3	
	6018-94-6	6047-25-2	6533-73-9	6556-16-7	7446-07-3	
	7446-08-4	7446-14-2	7446-18-6	7447-40-7, properties		
	7488-54-2	7631-95-0	7647-14-5, properties		7647-15-6,	
	properties	7647-17-8, properties		7677-15-8	7681-11-0,	
	properties	7681-49-4, properties		7681-82-5, properties		
	7722-64-7	7727-43-7	7757-79-1, properties		7758-01-2	
	7758-02-3, properties		7758-05-6	7758-88-5	7758-95-4	
	7758-97-6	7758-99-8	7759-02-6	7772-98-7	7778-74-7	
	7782-61-8	7782-82-3	7783-22-4	7783-32-6	7783-33-7	
	7783-39-3	7783-40-6	7783-46-2	7783-48-4	7783-64-4	
	7783-71-3	7783-73-5	7783-90-6	7783-96-2	7783-97-3	
	7784-00-1	7784-01-2	7784-09-0	7784-46-5	7785-23-1	
	7787-32-8	7787-36-2	7787-41-9	7787-43-1	7787-49-7	
	7787-50-0	7787-61-3	7787-63-5	7787-64-6	7787-69-1	
	7789-02-8	7789-17-5	7789-18-6	7789-23-3	7789-24-4,	
	properties	7789-27-7	7789-38-0	7789-39-1	7789-40-4	
	7789-75-5, properties		7789-80-2	7790-21-8	7790-28-5	
	7790-29-6	7790-30-9	7790-37-6	7790-38-7	7790-79-6	
	7790-80-9	7791-08-4	7791-11-9	7803-68-1	9002-84-0	
	10022-31-8	10022-66-9	10025-98-6	10025-99-7	10026-17-2	
	10031-22-8	10031-54-6	10042-76-9	10042-88-3	10048-95-0	
	10049-07-7	10099-60-2	10099-74-8	10101-63-0	10101-85-6	
	10101-95-8	10102-06-4	10102-20-2	10102-23-5	10277-44-8	
	10294-26-5	10294-40-3	10294-54-9	10377-48-7	10377-52-3	
	10466-65-6	10567-69-8	12017-94-6	12024-10-1	12024-21-4	

12026-57-2	12027-70-2	12030-24-9	12032-20-1	12036-15-6
12036-44-1	12037-01-3	12037-03-5	12037-29-5	12043-29-7
12048-50-9	12054-65-8	12055-23-1	12055-62-8	12060-08-1
12060-58-1	12061-16-4	12064-62-9	12070-06-3	12113-11-0
12183-49-2	12208-13-8	12210-46-7	12232-99-4	12251-36-4
12316-13-1	12423-25-5	12423-81-3	12439-27-9	12439-30-4
12439-96-2	12440-72-1	12671-30-6	13018-79-6	13126-12-0
13327-32-7	13400-13-0	13446-34-9	13454-71-2	13454-88-1
13454-89-2	13454-94-9	13455-28-2	13456-28-5	13463-67-7,
properties	13464-82-9	13465-34-4	13465-61-7	13469-97-1
13472-45-2	13473-75-1	13477-20-8	13477-47-9	13477-98-0
13478-93-8	13494-91-2	13510-34-4		

(photoelectron spectrum of)

IT	13510-44-6	13510-71-9	13537-15-0	13550-50-0	13566-04-6
	13566-10-4	13566-12-6	13566-13-7	13573-16-5	13598-16-8
	13600-74-3	13600-82-3	13628-54-1	13681-87-3	13682-61-6
	13702-39-1	13702-42-6	13709-38-1	13709-42-7	13709-46-1
	13709-49-4	13709-59-6	13746-66-2	13759-25-6	13760-80-0
	13760-81-1	13760-83-3	13765-19-0	13765-24-7	13765-25-8
	13765-26-9	13768-49-5	13775-53-6	13776-84-6	13782-33-7
	13813-99-5	13820-46-7	13820-74-1	13820-95-6	13845-06-2
	13859-51-3	13859-57-9	13870-19-4	13876-85-2	13932-13-3
	13940-83-5	13943-58-3	13963-58-1	13963-60-5	13967-50-5
	14013-75-3	14024-63-6	14038-43-8	14039-23-7	14075-53-7
	14099-12-8	14129-01-2	14214-04-1	14215-54-4	14217-01-7
	14220-17-8	14221-47-7	14267-17-5	14282-33-8	14282-91-8
	14285-79-1	14302-26-2	14323-32-1	14355-39-6	14402-89-2
	14434-22-1	14434-49-2	14481-26-6	14494-99-6	14516-46-2
	14637-31-1	14637-35-5	14639-94-2	14693-56-2	14693-78-8
	14708-53-3	14723-96-7	14723-97-8	14723-98-9	14723-99-0
	14732-16-2	14732-17-3	14732-18-4	14732-19-5	14740-97-7
	14767-09-0	14768-02-6	14783-10-9	14784-67-9	14791-55-0
	14854-54-7	14873-92-8	14945-15-4	14972-90-8	15002-92-3
	15060-35-2	15243-88-6	15273-85-5	15304-51-5	15305-50-7
	15347-43-0	15388-40-6	15479-84-2	15479-89-7	15492-38-3
	15513-87-8	15578-48-0	15597-46-3	15672-00-1	15694-03-8
	15742-38-8	15747-95-2	15810-50-1	16448-28-5	16569-73-6
	16575-62-5	16591-55-2	16755-95-6	16871-60-6	16871-86-6
	16871-90-2	16902-25-3	16903-39-2	16903-70-1	16905-14-9
	16919-27-0	16919-31-6	16919-58-7	16920-93-7	16921-30-5
	16924-00-8	16924-03-1	16940-97-9	16941-25-6	16942-01-1
	16949-12-5	17069-38-4	17084-13-8	17203-49-5	17362-44-6
	17362-48-0	17362-97-9	17363-00-7	17499-48-8	17499-77-3
	17499-95-5	17549-30-3	17767-20-3	17769-64-1	17769-65-2
	17805-63-9	17805-64-0	18007-60-8	18122-72-0	18282-10-5
	18432-96-7	18581-56-1	18756-20-2	18974-41-9	18998-81-7
	19121-78-9	19121-80-3	19153-98-1	19168-23-1	19276-52-9
	19400-33-0	19511-28-5	19528-17-7	19578-48-4	19610-63-0

19630-06-9	20260-05-3	20673-30-7	20730-46-5	20775-04-6
20792-39-6	20941-65-5	21093-83-4	21219-53-4	21338-24-9
21548-73-2	21563-00-8	21679-46-9	21774-03-8	21790-80-7
21908-53-2	22030-27-9	22446-84-0	22470-28-6	22471-42-7
22722-62-9	22723-52-0	22886-66-4	23081-32-5	23105-69-3
23340-47-8	23408-20-0	23793-19-3	24687-02-3	24687-03-4
25659-31-8	25749-74-0	26037-24-1	26156-59-2	26258-19-5
26291-88-3	26292-39-7	26292-40-0	26427-69-0	27685-51-4
28300-74-5	29090-30-0	29335-83-9	29831-95-6	29860-78-4
30111-44-5	31147-84-9	31386-68-2	32740-79-7	33849-39-7
33908-66-6	33991-54-7	34156-31-5	34249-18-8	34417-22-6
34417-23-7	35171-64-3	35759-56-9	35759-58-1	35759-65-0
35759-66-1	36447-91-3	36491-43-7	36535-39-4	37240-55-4
37488-13-4				

(photoelectron spectrum of)

IT	38139-15-0	38433-42-0	39394-96-2	39395-09-0	39395-45-4
	39395-46-5	39395-57-8	39395-61-4	39395-62-5	39395-63-6
	39395-91-0	39399-77-4	39406-96-7	39407-05-1	41119-82-8
	41724-71-4	41724-83-8	41815-98-9	41875-39-2	41875-40-5
	41875-41-6	41875-43-8	41875-49-4	41875-50-7	41875-51-8
	41875-60-9	41875-61-0	41875-64-3	41875-65-4	41875-66-5
	41875-67-6	41875-69-8	41875-70-1	41875-72-3	41875-73-4
	41875-76-7	41875-77-8	41875-80-3	41876-09-9	41876-10-2
	41876-11-3	41876-12-4	41876-13-5	41876-14-6	41876-15-7
	41876-17-9	41876-18-0	41876-19-1	41876-20-4	41876-21-5
	41876-22-6	41876-23-7	41876-26-0	41876-27-1	41876-29-3
	41876-30-6	41884-48-4	41898-43-5	41898-48-0	41898-49-1
	41898-50-4	41898-51-5	41898-52-6	41898-53-7	41898-54-8
	41898-55-9	41898-56-0	41898-58-2	41898-59-3	41898-60-6
	41898-61-7	41898-62-8	41898-63-9	41909-62-0	41909-64-2
	41909-65-3	41909-66-4	41909-70-0	41909-72-2	41909-73-3
	41909-74-4	41909-83-5	41909-84-6	41909-86-8	41909-87-9
	41909-88-0	41909-89-1	41909-90-4	41909-92-6	41909-95-9
	41944-01-8	41948-74-7	41984-94-5	41991-48-4	42030-50-2
	49553-27-7	52580-79-7	58856-18-1		

(photoelectron spectrum of)

IT	7429-90-5, properties	7429-91-6, properties	7439-88-5,
	properties	7439-89-6, properties	7439-91-0, properties
	7439-92-1, properties	7439-93-2, properties	7439-94-3,
	properties	7439-95-4, properties	7439-96-5, properties
	7439-97-6, properties	7439-98-7, properties	7440-00-8,
	properties	7440-02-0, properties	7440-03-1, properties
	7440-04-2, properties	7440-05-3, properties	7440-06-4,
	properties	7440-09-7, properties	7440-10-0, properties
	7440-15-5, properties	7440-16-6, properties	7440-17-7,
	properties	7440-18-8, properties	7440-19-9, properties
	7440-20-2, properties	7440-21-3, properties	7440-22-4,
	properties	7440-23-5, properties	7440-24-6, properties

7440-25-7, properties 7440-27-9, properties 7440-28-0,  
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 7440-31-5, properties 7440-32-6, properties 7440-33-7,  
 properties 7440-36-0, properties 7440-38-2, properties  
 7440-39-3, properties 7440-41-7, properties 7440-42-8,  
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 7440-46-2, properties 7440-47-3, properties 7440-48-4,  
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 7440-54-2, properties 7440-55-3, properties 7440-56-4,  
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 7440-66-6, properties 7440-67-7, properties 7440-69-9,  
 properties 7440-70-2, properties 7440-74-6, properties  
 7553-56-2, properties 7704-34-9, properties 7723-14-0,  
 properties 7726-95-6, properties 7727-37-9, properties  
 7782-41-4, properties 7782-49-2, properties 13494-80-9,  
 properties

(photoelectron spectrum of, in various compds.)

IT 10534-89-1P

(prepn. of)

L35 ANSWER 23 OF 30 HCA COPYRIGHT 2004 ACS on STN

78:115903 Stability constants of some outer-sphere type complexes involving cobalt(III). Ilcheva, L.; Beck, Mihaly T. (Inst. Phys. Chem., Kossuth Lajos Univ., Debrecen, Hung.). Proc. Symp. Coord. Chem., 3rd, Volume 1, 89-97. Editor(s): Beck, Mihaly T. Akad. Kiado: Budapest, Hung. (English) 1970. CODEN: 22RCAZ.

AB In aq. solns. with ionic strength  $\mu = 1\text{M}$  (KF) at  $22^\circ$ , the stability consts. of the outer-sphere complexes  $\text{Co}(\text{bip})_3.\text{NCS}_2^+$  (bip = bipyridine),  $\text{Co}(\text{bip})_3.\text{I}_2^+$ , and  $\text{Co}(\text{phen})_3.\text{I}_2^+$  (phen = phenanthroline) are  $K = 1.73, 1.50$ , and  $1.69$ , resp. With increasing  $\mu$  for  $\mu = 1\text{--}6\text{M}$  (KF),  $K$  for  $\text{Co}(\text{bip})_3.\text{NCS}_2^+$  went through a min. of  $1.00$  at  $\mu = 2.5\text{M}$ , and then increased to  $2.30$  at  $\mu = 6\text{M}$ ; with  $\mu = 1\text{M}$  (KCl),  $K = 0.95$  for  $\text{Co}(\text{dip})_3.\text{NCS}_2^+$ . In aq. solns. contg.  $\text{Co}(\text{NH}_3)_6^{3+}$  and concn.  $c = 0.1\text{--}1.0\text{M}$  of ligand ( $\text{X}^-$ ) at  $35^\circ$ , the equil. const. ( $K$ ) corresponding to formation of the outer-sphere complexes,  $\text{Co}(\text{NH}_3)_6^{3+} + \text{X}^- \rightleftharpoons \text{Co}(\text{NH}_3)_6.\text{X}_2^+$ , decreased with increasing  $c$ , where  $K = 1.20\text{--}3.14, 0.97\text{--}2.44$ , and  $1.23\text{--}1.97$  for  $\text{X}^- = \text{Cl}^-, \text{N}_3^-, \text{and NCS}^-$ , resp. In aq. soln. with  $\mu = 1.6$  ( $\text{NaClO}_4$ ) and pH  $3\text{--}9.8$  at  $30^\circ$ , the stability const. ( $K = 4.7$ ) for the outer-sphere complex formed between  $\text{d-Co(en)}_3^{3+}$  and diethylenetriaminepentaacetic acid was essentially independent of pH.

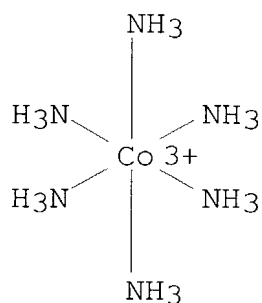
IT 10534-89-1P

(formation of)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX

NAME)

● 3 Cl<sup>-</sup>

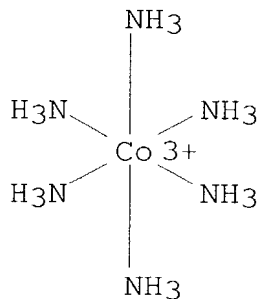
- CC 68-2 (Phase Equilibriums, Chemical Equilibriums, and Solutions)
- ST stability cobalt complex; isothiocyanato dipyridine cobalt  
stability; iodo phenanthroline cobalt stability; chloro ammine  
cobalt stability; azido ammine cobalt stability; ethylenediamine  
cobalt complex stability; ammine cobalt complex stability
- IT Ammines  
(cobalt, formation of outer sphere complexes of)
- IT 10534-89-1P 14523-20-7P 22418-37-7P  
(formation of)
- IT 16569-46-3  
(outer-sphere complex formation of, with  
diethylenetriaminepentaacetic acid)
- IT 67-43-6  
(outer-sphere complex formation of, with  
tris(ethylenediamine)cobalt ion)
- IT 14126-08-0 41928-26-1 41930-54-5  
(stability of)
- L35 ANSWER 24 OF 30 HCA COPYRIGHT 2004 ACS on STN
- 69:72296 Effect of chemical combination on the asymmetry of the K $\alpha$   
lines of cobalt. Mande, Chintamani; Nigavekar, A. S.; Chivate,  
Pushpa (Univ. Poona, Poona, India). Indian Journal of Physics,  
41(12), 897-901 (English) 1967. CODEN: IJPYAS. ISSN: 0019-5480.
- AB The asymmetry indexes of the Co K $\alpha$ 1 and K $\alpha$ 2 lines were  
deterd. for Co, CoCl<sub>2</sub>, diquinolinium Co(II) chloride (solid  
and liquid), Co(II) oxinate (hydrated and anhyd.), Co<sub>2</sub>O<sub>3</sub>,  
[Co(NH<sub>3</sub>)<sub>6</sub>]Cl<sub>3</sub>, Na<sub>3</sub>Co(NO<sub>2</sub>)<sub>6</sub>, and [Co(NH<sub>3</sub>)<sub>5</sub>-H<sub>2</sub>O  
]2(C<sub>2</sub>O<sub>4</sub>)<sub>3</sub> by using x-ray fluorescence techniques. The indexes for  
both lines decrease for the higher oxidn. states of Co. The  
magnitude of these indexes may depend on the no. of 3d electrons in

the central atom, rather than on its surroundings. The change in asymmetry of these lines was attributed to exchange polarization effects.

IT 7646-79-9, properties 10534-89-1  
 (spectrum (x-ray) of, K $\alpha$  line asymmetry in)  
 RN 7646-79-9 HCA  
 CN Cobalt chloride (CoCl<sub>2</sub>) (8CI, 9CI) (CA INDEX NAME)

Cl-Co-Cl

RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

CC 73 (Spectra and Other Optical Properties)  
 ST x ray lines Co asymmetry; cobalt x ray lines asymmetry  
 IT Ammines  
 (cobalt, x-ray spectra of)  
 IT Bonds  
 (in cobalt complexes and compds., K $\alpha$  x-ray spectral line asymmetry in relation to)  
 IT Spectra, x-ray  
 (of cobalt complexes and compds., K $\alpha$  line asymmetry in)  
 IT 8-Quinolinol, cobalt complex  
 (x-ray spectrum of)  
 IT 1308-04-9 7646-79-9, properties 10534-89-1  
 13600-98-1 13978-88-6 21350-40-3 34788-85-7  
 (spectrum (x-ray) of, K $\alpha$  line asymmetry in)  
 IT 7440-48-4, properties  
 (spectrum (x-ray) of, in cobalt complexes and compds., K $\alpha$  line asymmetry in)



IT 34788-85-7, properties  
(x-ray transmission by, integral characteristics of anomalous)

L35 ANSWER 25 OF 30 HCA COPYRIGHT 2004 ACS on STN

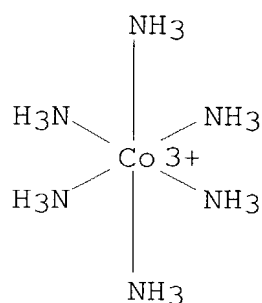
68:71382 Hydrometallurgical processing of nickeliferous laterite ore.  
V. Separation of cobalt and nickel by precipitation of cobalt as an  
ammine complex salt. Ono, Kenji; Matsushima, Tomoo; Kamon, Noboru  
(Tohoku Univ., Sendai, Japan). Tohoku Daigaku Senko Seiren  
Kenkyusho Iho, 23(1), 21-4 (Japanese) 1967. CODEN: TDSSA2. ISSN:  
0040-876X.

AB The sepn. of Co from Ni by pptg. Co,  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ , was studied.  
Many factors such as the concn. of  $\text{NH}_3$  and Cl in soln., the addn. of  
activated charcoal, and the oxidn. conditions were detd. In addn.  
to the above expts., the soly. of  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$  in various  $\text{NH}_3$  and  
Cl solns. was detd.

IT **10534-89-1P**  
(formation and soly. of, in ammonia and chlorine, cobalt sepn.  
from nickel in relation to)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX  
NAME)



● 3  $\text{Cl}^-$

CC 54 (Extractive Metallurgy)  
ST PPTN CO AMMINE SALTS; COBALT NI SEPN; NICKEL CO SEPN; LATERITE ORES  
TREATMENT

IT **10534-89-1P**  
(formation and soly. of, in ammonia and chlorine, cobalt sepn.  
from nickel in relation to)

IT 7440-02-0, uses and miscellaneous  
(sepn. of, from cobalt by ammine complex)

IT 7440-48-4P, preparation  
(sepn. of, from nickel by ammine complex)

L35 ANSWER 26 OF 30 HCA COPYRIGHT 2004 ACS on STN

67:11891 Interaction of poly(vinylamine) with metal salts in aqueous solutions. Tolmachov, V. M.; Lomako, L. A.; Dinh Suang Dinh (A. M. Gor'kii Khar'kovsk. Gos. Univ., Kharkov, USSR). Vysokomolekulyarnye Soedineniya, Seriya B: Kratkie Soobshcheniya, 9(3), 211-14 (Russian) 1967. CODEN: VYSBAI. ISSN: 0507-5483.

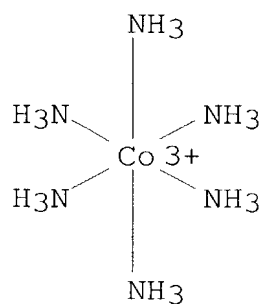
AB Poly(vinylamine) (I) ( $pK = 9.4 \pm 0.2$ ) formed solid water-insol. complexes with metal salts when 1 vol. of a 1% I soln. was boiled with 1 vol. of a 10% metal salt soln. By analysis, the following metal-II ratios were obtained: (reagent and ratio given)  $ZnSO_4$ , 1:2;  $NiSO_4$ , 1:4.0;  $CdSO_4$ , 1:3.5;  $CoSO_4$ , 1:4.0;  $CuSO_4$ , 1:2.4;  $CoCl_2 \rightarrow H_2O_2$ , 1:5.2. Tentative structures (II and III) ( $R = H_2O$ ,  $NH_3$ , or  $OH^-$ ,  $M = metal$ ) are proposed for the complexes. Pycnometer d. (d.) and magnetic susceptibility ( $\chi$ ) measurements gave the following effective magnetic moments ( $\mu_{eff}$ ) according to Simek (S. and Navratil, CA 54: 10406c); (complex, d,  $\chi$ ,  $\mu_{eff}$  given). I, 1.15, 0.86, -; I.Zn, 1.30, 0.28, -; I.Cd, 1.36, 0.29, -; I.Cu 1.34, 1.77, 1.4; I.Ni, 1.14, 4.76, 3.0; I, $Co^{2+}$ , 1.20, 1.21, 1.7; I, $Co^{3+}$ , 1.29, 1.83, 1.9; I. $Cu(NH_3)_4SO_4 \cdot H_2O$ , 1.45, 6.03, 1.9;  $Ni(NH_3)_6Cl_2$ , 1.30, 18.05, 3.2;  $Co(NH_3)_6Cl_3$ , 1.53, 0.89, -, -.

IT 10534-89-1

(magnetic properties of)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3  $Cl^-$

CC 35 (Synthetic High Polymers)

ST POLYVINYLAMINE METAL IONS INTERACTIONS

IT Ammines

(metal complexes, magnetic properties of)

- IT Cadmium, with vinylamine polymers  
 Cobalt, with vinylamine polymers  
 Copper, with vinylamine polymers  
 Nickel, complexes with vinylamine polymers  
 Vinylamine, polymers, metal complexes  
 Zinc, complexes with vinylamine polymers  
 (magnetic properties of)
- IT 10380-29-7 10534-88-0 **10534-89-1**  
 (magnetic properties of)

L35 ANSWER 27 OF 30 HCA COPYRIGHT 2004 ACS on STN

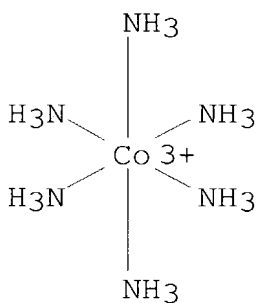
66:7985 Derivatographic study of the reaction of hexaamminecobalt(III) chloride with alkali nitrates. Pfeifer Flora, Terez (Forschungsinst. Chem. Schwerind., Vespem, Hung.). Mikrochimica Acta (4-5), 915-25 (German) 1966. CODEN: MIACAQ. ISSN: 0026-3672.

AB Derivatographic study combined with data obtained from heating mixts. of  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$  and nitrates of all the alkali metals and  $\text{NH}_4^+$ , showed the formation of  $[\text{MCo}(\text{NH}_3)_{1.5}\text{NO}_3.\text{Cl}]\text{Cl}_2$ , where M represents the alkali metal. The decompn. reactions started at lower temps. in the mixts. than in the components sep.; the mechanisms vary with the reagent present in excess.

IT **10534-89-1**  
 (reactions of, with alkali metal nitrates)

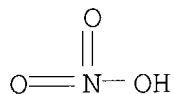
RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3  $\text{Cl}^-$

- IT **6484-52-2**, reactions  
 (with hexaamminecobalt(3+) trichloride)
- RN 6484-52-2 HCA
- CN Nitric acid ammonium salt (8CI, 9CI) (CA INDEX NAME)



● NH<sub>3</sub>

- CC 78 (Inorganic Chemicals and Reactions)  
 ST COBALT AMMINE CHLORIDES REACTIONS; AMMINES CO  
**CHLORIDES** REACTIONS; ALKALI NITRATES REACTIONS CO COMPLEXES;  
 CHLORIDES CO AMMINES REACTIONS; NITRATES REACTIONS CO COMPLEXES  
 IT Ammines  
 (cobalt)  
 IT Cobalt potassium chloride nitrate (KCoCl<sub>3</sub>(NO<sub>3</sub>)), sesquiammoniate  
 Potassium **cobalt chloride** nitrate (KCoCl<sub>3</sub>(NO<sub>3</sub>)),  
 sesquiammoniate  
 (prepn. of)  
 IT 10534-89-1  
 (reactions of, with alkali metal nitrates)  
 IT 7789-18-6 7790-69-4  
 (reactions of, with hexaamminecobalt(3+) trichloride)  
 IT 7757-79-1, reactions  
 (with hexaamminecobalt(2+) trichloride)  
 IT 6484-52-2, reactions 7631-99-4, reactions  
 (with hexaamminecobalt(3+) trichloride)

L35 ANSWER 28 OF 30 HCA COPYRIGHT 2004 ACS on STN

64:65227 Original Reference No. 64:12175d-h Preparation of complex salts of cobalt, copper, and chromium. Wang, Chih-Shih Bull. Inst. Chem., Acad. Sinica, No. 9, 63-8 (English) 1964.

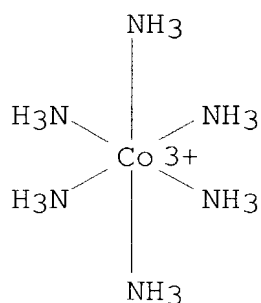
AB To a brownish violet mixt. of 100 ml. distd. H<sub>2</sub>O, **CoCl<sub>2</sub>** .6H<sub>2</sub>O 120 g., and NH<sub>4</sub>Cl 80 g. was added activated carbon 2 g. and concd. **NH<sub>4</sub>OH** 250 ml.; compressed air was bubbled into the resulting mixt. for 5 hrs. The brownish black ppt., after sepn. was dissolved in 14 ml. concd. HCl in 750 ml. of distd. H<sub>2</sub>O on a water bath. To the warm filtrate was added 200 ml. of concd. HCl. On cooling, [Co(NH<sub>3</sub>)<sub>6</sub>Cl<sub>3</sub>] ppt. was filtered off, washed with EtOH, and dried. A soln. of NH<sub>4</sub>Cl 100 g. and NaNO<sub>2</sub> 135 g. in 750 ml. of distd. H<sub>2</sub>O was added to **CoCl<sub>2</sub>**.6H<sub>2</sub>O 90 g. in 250 ml. of distd. H<sub>2</sub>O; then 500 ml. of 20% **NH<sub>4</sub>OH** was added. Oxidn. was attained by bubbling compressed air into the mixt. for 4 hrs. The mixt. was allowed to evap. at room temp. for 15 days. The crystals were filtered, washed with distd. H<sub>2</sub>O until no Cl<sup>-</sup> was detected in the filtrate. Pure Co(NH<sub>3</sub>)<sub>3</sub>(NO<sub>2</sub>)<sub>3</sub> crystals were obtained by dissolving the crude product in 450 ml. of distd. H<sub>2</sub>O and 10 ml. of HOAc at 93° and then cooling to 5°.

Crystals (blue prisms or plates) of  $\text{Cu}(\text{dip})(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$  were prep'd. at  $5^\circ$  from a soln. of  $\text{Cu}-(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$  7.8169 g. and  $\alpha, \alpha'$ -dipyridyl(dip) 5.0519 g. in hot distd.  $\text{H}_2\text{O}$ . The product was recrystd. from  $\text{H}_2\text{O}$ .  $\text{Cu}(\text{DMG})\text{-Cl}_2$  was obtained by the addn. of dimethylglyoxime (DMG) 3 g. to  $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$  12.7 g. in 100 ml. of distd.  $\text{H}_2\text{O}$ . Evapn. to dryness of a hot distd.  $\text{H}_2\text{O}$  soln. of  $\text{K}_2\text{Cr}_2\text{O}_7$  9.5 g.  $\text{K}_2\text{CrO}_4 \cdot \text{H}_2\text{O}$  11.5 g., and oxalic acid 27.5 g. yielded  $\text{K}_3[\text{Cr}(\text{C}_2\text{O}_4)_3]$ . cis- $\text{K}[\text{Cr}(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})_2]$  (I) was prep'd. by the addn. of a few drops of distd.  $\text{H}_2\text{O}$  to a mixt. of  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$  followed by standing for 24 hrs. trans- $\text{K}[\text{Cr}(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})_2]$  (II) was obtained by the addn. of  $\text{K}_2\text{Cr}_2\text{O}_7$  15 g. to a hot distd.  $\text{H}_2\text{O}$  soln. of 45 g. of  $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$ . After the evolution of heat, the mixt. became dark green to which was added a few drops of distd.  $\text{H}_2\text{O}$ . Cooling in the refrigerator changed it into the colloid state. cis- $\text{K}_2[\text{Cr}(\text{OH})(\text{C}_2\text{O}_4)_2(\text{H}_2\text{O})]$  was prep'd. by adding 25 ml. of distd.  $\text{H}_2\text{O}$  and 11 ml. of 50%  $\text{KOH}$  to 50 g. of the ground I. The trans comp'd. was obtained by heating a distd.  $\text{H}_2\text{O}$  soln. of II 20 g. and  $\text{KOAc}$  30 g. followed by cooling. The reaction of  $\text{Zn}$ , 12N  $\text{HCl}$ , and  $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$  was carried out in a breaker immersed in ice and  $\text{NaCl}$ .  $\text{NH}_4\text{OH}$  (7.2N) and  $\text{NH}_4\text{Cl}$  were added to the mixt. through which air was bubbled until gray green  $[\text{Cr}_2(\text{OH})(\text{NH}_3)_{10}]\text{Cl}_{15}$ .  $\text{H}_2\text{O}$  (III) pptd. Pure product was obtained by repeating 3 times the process of dissolving the ppt. in 0.001N  $\text{HCl}$  and pptg. it with dropwise addn. of 12N  $\text{HCl}$ . Addn. of 95%  $\text{EtOH}$  to a soln. of III in 2N  $\text{NH}_4\text{OH}$  yielded  $[\text{Cr}_2(\text{OH})(\text{NH}_3)_9\text{OH}]\text{Cl}_{14} \cdot 2\text{H}_2\text{O}$ . When the soln. of III in 2N  $\text{NH}_4\text{OH}$  was allowed to stand for 30 min. and 12N  $\text{HCl}$  added,  $[\text{Cr}_2(\text{OH})(\text{NH}_3)_9\text{H}_2]\text{Cl}_{15} \cdot \text{H}_2\text{O}$  (IV) was pptd. When IV was added to a soln. of  $\text{NH}_4\text{SCN}$  and  $\text{NH}_4\text{Cl}$ ,  $[\text{Cr}_2(\text{OH})(\text{NH}_3)_9(\text{SCN})]\text{Cl}_{14} \cdot 2\text{H}_2\text{O}$  (V) was collected. When IV was dried at  $90^\circ$  for 12 hrs., 1 mol. of  $\text{H}_2\text{O}$  was eliminated. When  $\text{NH}_2\text{C}_2\text{H}_4\text{NH}_2$  was added to V,  $[\text{Cr}_2\text{O}(\text{NH}_3)_9(\text{NH}_2\text{C}_2\text{H}_4\text{NH}_2)]\text{Cl}_4$  (VI) was obtained. Addn. of 12N  $\text{HCl}$  to VI yielded  $[\text{Cr}_2(\text{OH})(\text{NH}_3)_9\text{NH}_2\text{C}_2\text{H}_4\text{NH}_3]\text{Cl}_{16} \cdot 4\text{H}_2\text{O}$ .

IT 10534-89-1, Cobalt, hexaamminecobalt trichloride  
(prepn. of)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)



● 3 Cl<sup>-</sup>

- CC 14 (Inorganic Chemicals and Reactions)  
 IT Ammines  
     (chromium and Co)  
 IT Chromate(III), dioxalatodiaquo-, cis-  
     Chromate(III), dioxalatodiaquo-, trans-  
     Chromate(III), hydroxydioxalatoaquo-, cis-  
     Chromate(III), hydroxydioxalatoaquo-, trans-  
 IT Chromium compounds, dihydroxynonaamminedichromium tetrachloride,  
     dihydrate  
     Chromium compounds, hydroxyaquaononaamminedichromium pentachloride,  
     hydrate  
     Chromium compounds, hydroxydecaamminedichromium pentachloride,  
     hydrate  
     Chromium compounds, hydroxynonaammine[ethylenediaminium(H)]dichromiu  
     m hexachloride, tetrahydrate  
     Chromium compounds, hydroxythiocyanat ononaam mine dichrom i um  
     tetrachloride, dihydrate  
     Chromium compounds, oxononaammine(ethylenediamine)dichromium  
     tetrachloride  
     Potassium dioxalatodiaquochromate(III), cis-  
     Potassium dioxalatodiaquochromate(III), trans-  
     Potassium hydroxydioxalatoaquochromate(III), K<sub>2</sub>[Cr(OH)(C<sub>2</sub>O<sub>4</sub>)<sub>2</sub>(H<sub>2</sub>O)],  
     cis-  
     Potassium hydroxydioxalatoaquochromate(III), K<sub>2</sub>[Cr(OH)(C<sub>2</sub>O<sub>4</sub>)<sub>2</sub>(H<sub>2</sub>O)],  
     trans-  
     Potassium trioxalatochromate(III), K<sub>3</sub>[Cr(C<sub>2</sub>O<sub>4</sub>)<sub>3</sub>], compd. with  
     H<sub>3</sub>[Cr(C<sub>2</sub>O<sub>4</sub>)<sub>3</sub>] and strychnine (1:2:6)  
     (prepn. of)  
 IT 107-15-3, Ethylenediamine  
     (chromium complexes)  
 IT 95-45-4, Glyoxime, dimethyl- 366-18-7, 2,2'-Bipyridine

(copper complexes)

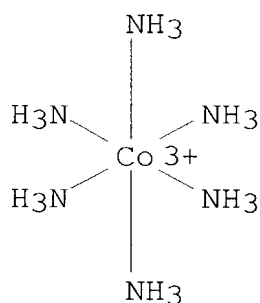
- IT 10534-89-1, Cobalt, hexaamminecobalt trichloride  
 13600-88-9, Cobalt, trinitrotriammine- 14281-62-0, Copper,  
 dichloro(dimethylglyoxime)- 15054-01-0, Chromate(III), trioxalato-  
 15635-35-5, Copper, dinitrato(2,2'-bipyridine)-, trihydrate  
 (prepn. of)

L35 ANSWER 29 OF 30 HCA COPYRIGHT 2004 ACS on STN

64:16860 Original Reference No. 64:3050a-b Peculiarities and shape of  
 the polarographic double wave in solutions of proteins (according to  
 Brdicka). Mairanovskii, S. G. (Inst. Org. Chem., Moscow).  
 Elektrokimiya, 1(10), 1263-7 (Russian) 1965. CODEN: ELKKAX. ISSN:  
 0424-8570.

- AB The catalytic waves of egg albumin with  $\text{Co}(\text{NH}_3)_6\text{Cl}_3$  in an  
**NH<sub>4</sub>OH-NH<sub>4</sub>Cl** buffer were studied. The shape of the  
 superficial wave (1st wave) was described by the 2 relations  
 $E = E_{1/2} - (RT/\alpha n F) \ln(i/i_{\text{lim}} - i)$ ;  
 $i_{\text{lim}} = 0.88 \exp[-9(E - E_M)^2]$  according to the  
 Frumkin theory of adsorption ( $E_M$  is potential of max.  
 adsorption). The shape of the vol. wave (2nd wave) was described by  
 the relation  $E = E'_{1/2} -$   
 $(RT/\alpha' n' F) \ln(i'/i'_{\text{lim}} - i')$ ,  $i'_{\text{lim}}$  being independent  
 of the potential;  $E_{1/2} = -1.22 \text{ v.}$ ,  $E_M = -1.40 \text{ v.}$ ,  
 $E'_{1/2} = -1.463 \text{ v.}$ ,  $(RT/\alpha' n' F) = 0.052 \text{ v.}$

- IT 10534-89-1, Cobalt, hexaamminecobalt trichloride  
 (in ovalbumin polarography, H catalytic waves and)  
 RN 10534-89-1 HCA  
 CN Cobalt(3+), hexaammine-, trichloride, (OC-6-11)- (9CI) (CA INDEX  
 NAME)

● 3 Cl<sup>-</sup>

- CC 15 (Electrochemistry)  
 IT Catalysts and Catalysis

(in redn., of H, in presence of hexamminecobalt trichloride and proteins)

IT Ovalbumins

(polarography of, in presence of hexaaminecobalt trichloride, H catalytic waves in)

IT 10534-89-1, Cobalt, hexaaminecobalt trichloride

(in ovalbumin polarography, H catalytic waves and)

IT 1333-74-0, Hydrogen

(polarographic catalytic waves of, in presence of ovalbumins and hexaamine-cobalt trichloride)

L35 ANSWER 30 OF 30 HCA COPYRIGHT 2004 ACS on STN

58:78605 Original Reference No. 58:13405g-h,13406a Complex compounds of trivalent cobalt with  $\alpha$ -benzil dioxime. Ablov, A. V.; Syrtsova, G. P. (State Univ., Kishinev). Zhurnal Neorganicheskoi Khimii, 7, 2066-70 (Unavailable) 1962. CODEN: ZNOKAQ. ISSN: 0044-457X.

AB cf. CA 56, 9709d. Complex compds. of  $\text{Co}^{+++}$  with  $\alpha$ -benzil dioxime (Df) (I) were studied to det. the effect of an exchange of a Me group in dimethylglyoxime by an aromatic radical on the reaction of substitution within the inner sphere of Co dioximes. Blowing air through 75 ml. BuOH, 1.1 g.  $\text{CoBr}_3$ , and 2.4 g. I heated on a  $\text{H}_2\text{O}$  bath till I dissolved, cooling, filtering, and recrystg. from MeOH gave  $\text{H}[\text{Co}(\text{Df})_2\text{Br}_2] \cdot 3\text{MeOH}$ . Treating filtrate with 57% HBr pptd.  $\text{H}[\text{Co}(\text{Df})_2\text{X}] \cdot 5\text{H}_2\text{O}$  (II), X = Br, green prisms. The chloride was similarly prepd. Wetting II with MeOH and covering with a layer of  $\text{H}_2\text{O}$  gave  $[\text{CoH}_2\text{O}(\text{Df})_2\text{X}]$  (III). Treating II (X = Cl) with  $\text{NaNO}_2$  gave  $\text{Na}[\text{Co}(\text{Df})_2(\text{NO}_2)_2] \cdot 10\text{H}_2\text{O}$ , which treated with 1:1  $\text{H}_2\text{SO}_4$  gave  $\text{H}[\text{Co}(\text{Df})_2(\text{NO}_2)_2] \cdot 5\text{H}_2\text{O}$ . Heating it with HCl on a water bath gave  $[\text{CoH}_2\text{O}(\text{Df})_2\text{NO}_2] \cdot 3.5\text{H}_2\text{O}$ . Dissolving III (X = Cl) in warm 10-15 ml. MeOH and adding 0.47 g.  $\text{NH}_4\text{SCN}$  in 4-5 ml.  $\text{H}_2\text{O}$  gave  $\text{NH}_4[\text{Co}(\text{Df})_2(\text{SCN})_2] \cdot \text{H}_2\text{O}$ , yellow crystals. The K analog, similarly prepd., dissolved in warm MeOH and treated with concd. HCl gave II, X = SCN, which wetted with MeOH and treated with a little  $\text{H}_2\text{O}$  and  $\text{NH}_4\text{OH}$  gave III, X = SCN. Treating III, X = Cl, with concd. NaOH gave  $\text{Na}[\text{Co}(\text{Df})_2(\text{OH})_2]$ . Adding 120 ml. BuOH to 1.3 g.  $\text{CoCl}_3$ , 2.37 g. pyridine, and 4.8 g. I and blowing air while warming a water bath till all of I dissolved yielded 75%  $[\text{Co}(\text{py})_2(\text{Df})_2]\text{Cl}$ . Similarly  $[\text{Co}(\text{py})(\text{Df})_2\text{Cl}]$  was obtained with a yield of 80-85%.

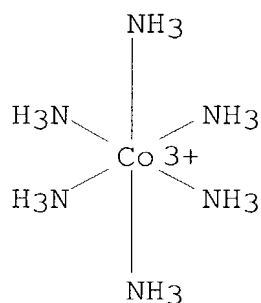
IT 10534-89-1, Cobalt, hexaaminecobalt trichloride

(decompn. by heat)

RN 10534-89-1 HCA

CN Cobalt(3+), hexaamine-, trichloride, (OC-6-11)- (9CI) (CA INDEX NAME)





● 3 Cl<sup>-</sup>

- CC 14 (Inorganic Chemicals and Reactions)  
 IT Ammines  
     (cobalt, decompn. by heat)  
 IT Ammonium bis(diphenylglyoximato)dithiocyanatocobaltate(III), hydrate  
     Cobalt, bis(diphenylglyoximato)bis(pyridine) **cobalt**  
     **chloride**  
     Cobaltate(III), bis(diphenylglyoximato)dithiocyanato-  
     Cobaltate(III), dibromobis(diphenylglyoximato)-  
     Cobaltate(III), dichlorobis(diphenylglyoximato)-  
     Cobaltate(III), dihydroxybis(diphenylglyoximato)-  
     Cobaltate(III), dinitrobis(diphenylglyoximato)-  
     Glyoxime, diphenyl-, cobalt complex  
     Hydrogen bis(diphenylglyoximato)dithiocyanatocobaltate(III),  
     pentahydrate  
     Hydrogen dibromobis(diphenylglyoximato)cobaltate(III), compd. with  
     MeOH, (1:3)  
     Hydrogen dibromobis(diphenylglyoximato)cobaltate(III), pentahydrate  
     Hydrogen dinitrobis(diphenylglyoximato)cobaltate(III), pentahydrate  
     Methanol, compd. with H dibromobis(diphenylglyoximato)  
     cobaltate(III) (3:1)  
     Sodium dinitrobis(diphenylglyoximato)cobaltate(III), decahydrate  
 IT Cobalt, bis(hexaamminecobalt) trisulfate  
     Cobalt, hexakis(hydroxylamine) **cobalt trichloride**  
     (decompn. by heat)  
 IT 110-86-1, Pyridine  
     (cobalt complexes)  
 IT 7803-49-8, Hydroxylamine  
     (cobalt complexes, decompn. by heat)  
 IT **10534-89-1**, Cobalt, hexaamminecobalt trichloride  
     13859-51-3, Cobalt, chloropentaammine-, dichloride  
     (decompn. by heat)

IT 25969-20-4, Sodium dihydroxybis(diphenylglyoximato)cobaltate(III)  
36795-68-3, Cobalt, chlorobis(diphenylglyoximato)aquo- 40309-69-1,  
Cobalt, bromobis(diphenylglyoximato)aquo- 53495-52-6, Cobalt,  
chlorobis(diphenylglyoximato)(pyridine)- 58034-57-4, Cobalt,  
nitrobis(diphenylglyoximato)aquo- 103444-09-3, Potassium  
bis(diphenylglyoximato)dithiocyanatocobaltate(III) 108597-43-9,  
Hydrogen dichlorobis(diphenylglyoximato)cobaltate(III)  
108755-92-6, Cobalt, bis(diphenylglyoximato)thiocyanatoaquo-  
(prepn. of)

=> d his l36-

L36 FILE 'REGISTRY' ENTERED AT 11:36:41 ON 26 FEB 2004  
394 S L2 NOT C/ELS

L37 FILE 'HCA' ENTERED AT 11:37:34 ON 26 FEB 2004  
131 S L36/P  
L38 27 S L37 AND (L18 OR L19)  
L39 2 S L38 AND L20  
L40 2 S L39 AND (L21 OR L22 OR L23)  
L41 0 S (L39 OR L40) NOT (L34 OR L35)  
L42 18 S L38 NOT (L34 OR L35)

=> d l42 1,2,3,5 cbib abs hitstr ind

L42 ANSWER 1 OF 18 HCA COPYRIGHT 2004 ACS on STN  
136:410537 Synthesis and investigation of ammine complexes of d-metals'  
dithioarsenates. Gakhutishvili, M.; Gigauri, R.; Machaidze, Z.;  
Koranashvili, G.; Kokhreidze, M. (Javakhishvili Tbilisi State  
University, Russia). Bulletin of the Georgian Academy of Sciences,  
164(1), 59-62 (English) 2001. CODEN: BGASFC. ISSN: 1560-0262.  
Publisher: Georgian Academy of Sciences.

AB Ammines of Sc(III), Y(III) and La(III) are easily pptd. by the  
action of precipitant, sodium dithioarsenate(V), on products of the  
reaction of sol. salts with excess **ammonium**  
**hydroxide**, while ammines of Cr(III) and Fe(III)  
dithioarsenates may be synthesized only by reaction of ligand (NH3)  
on the complex-forming intermediate obtained by treatment of metal  
salt with **ammonium hydroxide**.

IT 430430-42-5P

(prepn. of)

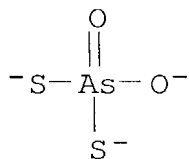
RN 430430-42-5 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, arsenodithioate (1:1) (9CI)  
(CA INDEX NAME)

CM 1

CRN 33170-85-3

CMF As O2 S2

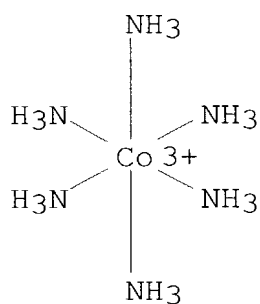


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



- CC 78-7 (Inorganic Chemicals and Reactions)
- ST transition metal ammine dithioarsenate prepn
- IT Transition metal complexes  
(ammines; prepn. of dithioarsenate salts of transition metal ammine complexes)
- IT Ammine complexes  
(transition metal; prepn. of dithioarsenate salts of transition metal ammine complexes)
- IT 7646-79-9, Cobalt dichloride, reactions 7705-08-0, Ferric chloride, reactions 10099-60-2, Dilanthanum trisulfate 10141-00-1, Chromium potassium sulfate ( $\text{CrK}(\text{SO}_4)_2$ ) 10361-93-0, Yttrium nitrate 13465-60-6, Scandium nitrate  
(for prepn. of dithioarsenate salt of transition metal ammine complex)
- IT 38007-31-7, Sodium thioarsenate ( $\text{Na}_3\text{AsO}_2\text{S}_2$ )  
(for prepn. of dithioarsenate salts of transition metal ammine complexes)
- IT 430430-37-8P 430430-38-9P 430430-39-0P 430430-40-3P  
430430-41-4P **430430-42-5P**  
(prepn. of)
- L42 ANSWER 2 OF 18 HCA COPYRIGHT 2004 ACS on STN
- 120:169467 Separation of cobalt from nickel after ammoniacal leaching of sulfide ores. Kerfoot, Derek G. E. (Sherritt Gordon Ltd., Can.). PCT Int. Appl. WO 9323578 A2 19931125, 24 pp. DESIGNATED STATES: W: AU, BR, CA, FI, JP, NO, RU, US; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1993-CA213 19930519. PRIORITY: CA 1992-2068982 19920519.
- AB The Co is sepd. from aq. soln. contg.  $\text{Co}^{3+}$  and  $\text{Ni}^{2+}$  hexammine sulfates by adding  $(\text{NH}_4)_2\text{SO}_4$  and satg. the soln. with  $\text{NH}_3$  at a

controlled temp. to ppt. the triple salt of  $\text{Co}^{3+}$  hexammine sulfate- $\text{Ni}^{2+}$  hexammine sulfate- $\text{NH}_4$  sulfate. is pptd. The pptd. triple salt is recovered from the soln., and mixed with water or aq.  $\text{NH}_4\text{OH}$  to selectively leach the  $\text{Ni}^{2+}$  hexammine sulfate, resulting in the  $\text{Co}^{3+}$  hexammine sulfate as solid residue having the  $\text{Co}:\text{Ni}$  ratio of  $\geq 100:1$ . The purified Co salt can be reacted in hot aq. soln. with Co powder to prep.  $\text{Co}^{2+}$  diammine sulfate soln. suitable for redn. with  $\text{H}_2$  for prepn. of Co powder.

IT 14553-20-9P 153512-34-6P

(prepn. of, after ammoniacal leaching of sulfide ores, metal sepn. with)

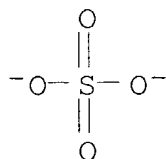
RN 14553-20-9 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, sulfate (2:3) (9CI) (CA INDEX NAME)

CM 1

CRN 14808-79-8

CMF O4 S

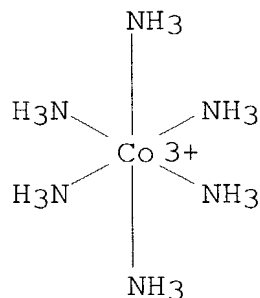


CM 2

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



RN 153512-34-6 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, ammonium (OC-6-11)-hexaamminenickel(2+) sulfate (1:1:1:3), hexahydrate (9CI) (CA INDEX

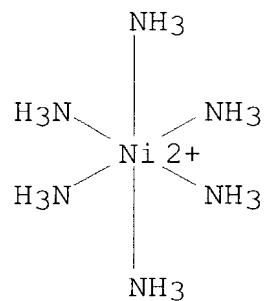
NAME)

CM 1

CRN 15365-74-9

CMF H18 N6 Ni

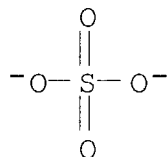
CCI CCS



CM 2

CRN 14808-79-8

CMF O4 S



CM 3

CRN 14798-03-9

CMF H4 N

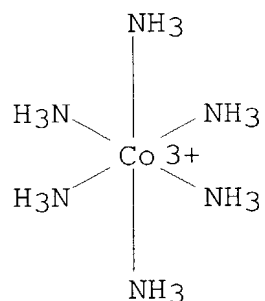


CM 4

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



CM 5

CRN 7732-18-5

CMF H2 O

H<sub>2</sub>O

IC ICM C22B003-44

ICS C22B003-14

ICA C22B023-00

CC 54-3 (Extractive Metallurgy)

ST sulfide nickel ore ammoniacal leaching; cobalt sepn nickel sulfide ore leaching; ammine cobalt sulfate prepn ore leaching

IT **14553-20-9P** 15651-41-9P **153512-34-6P**

(prepn. of, after ammoniacal leaching of sulfide ores, metal sepn. with)

IT 7783-20-2, Diammonium sulfate, uses

(reagent, ammoniacal soln. treated with, for cobalt sepn. after leaching of sulfide ores)

IT 7440-02-0P, Nickel, preparation

(sepn. of, from cobalt, after ammoniacal leaching of sulfide ores)

IT 7440-48-4P, Cobalt, preparation

(sepn. of, from nickel, after ammoniacal leaching of sulfide ores)

L42 ANSWER 3 OF 18 HCA COPYRIGHT 2004 ACS on STN

113:47499 Ammonia complexes of hexaamminecobalt(III) in aqueous salt solutions. Stupko, T. V.; Isaev, I. D.; Mironov, V. E. (Sib. Tekhnol. Inst., Krasnoyarsk, USSR). Koordinatsionnaya Khimiya, 16(4), 555-7 (Russian) 1990. CODEN: KOKHDC. ISSN: 0132-344X.

AB The soly. of [Co(NH<sub>3</sub>)<sub>6</sub>](ClO<sub>4</sub>)<sub>3</sub> was detd. in 1M NH<sub>4</sub>ClO<sub>4</sub> solns. contg. 0-10 M NH<sub>3</sub> of 298 K. Comparison with KClO<sub>4</sub> std. soly. isotherms in aq. salt-NH<sub>3</sub> solns. indicates formation of outer-sphere NH<sub>3</sub> complexes [Co(NH<sub>3</sub>)<sub>6</sub>](NH<sub>3</sub>)<sub>n</sub><sup>3+</sup> with stability consts.

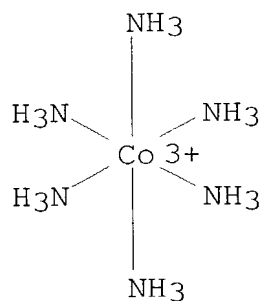
(log  $K_n$ ) for complexes with  $n = 1, 2, 3$  equal to  $0.95 \pm 0.09$  or  $-0.79$ ,  $0.59 \pm 0.09$  or  $1.15$ , and  $0.28 \pm 0.12$  or  $-1.46$ , resp.  
(H<sub>2</sub>O concn. expressed as mol/dm<sup>3</sup> or as mol fraction, resp.).

IT **81254-25-3P 128137-63-3P 128167-50-0P**

(formation of, in aq. salt solns.)

RN 81254-25-3 HCA

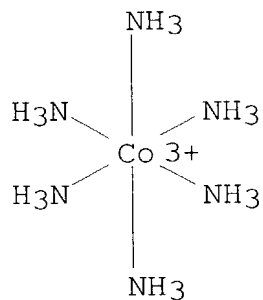
CN Cobalt(3+), hexaammine-, diammoniate, (OC-6-11)- (9CI) (CA INDEX NAME)



● 2 NH<sub>3</sub>

RN 128137-63-3 HCA

CN Cobalt(3+), hexaammine-, triammoniate, (OC-6-11)- (9CI) (CA INDEX NAME)

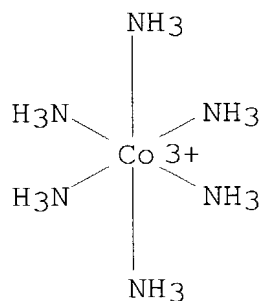


● 3 NH<sub>3</sub>

RN 128167-50-0 HCA

CN Cobalt(3+), hexaammine-, monoammoniate, (OC-6-11)- (9CI) (CA INDEX NAME)





● NH<sub>3</sub>

- CC 68-3 (Phase Equilibriums, Chemical Equilibriums, and Solutions)  
 ST cobalt ammine outer sphere complex; soly cobalt ammine perchlorate;  
 ammonia outer sphere complex cobalt  
 IT **81254-25-3P 128137-63-3P 128167-50-0P**  
 (formation of, in aq. salt solns.)  
 IT 7790-98-9, Ammonium perchlorate  
 (soly. in aq. solns. of, of cobalt ammine complex perchlorate)  
 IT 13820-83-2, Hexaamminecobalt(3+) triperchlorate  
 (soly. of, in aq. salt solns. contg. ammonia, outer sphere  
 complex formation in relation to)

L42 ANSWER 5 OF 18 HCA COPYRIGHT 2004 ACS on STN

108:193420 Selection of species and quantity of activated carbon as  
 catalyst of the hexamminocobalt(III) sulfate-nitrate synthesis.  
 Wlodyka, Jerzy (Inst. Met. Niezależnych, Gliwice, Pol.). Przemysł  
 Chemiczny, 66(8), 385-7 (Polish) 1987. CODEN: PRCHAB. ISSN:  
 0033-2496.

AB Among the investigated com. activated carbons (Z-1, Z-2, Z-3, Z-4,  
 and WS), Z-3 is considered the most suitable for oxidn. of Co<sup>2+</sup> to  
 [Co(NH<sub>3</sub>)<sub>6</sub>]<sup>3+</sup> in **NH<sub>4</sub>OH** medium in the presence of Ni<sup>2+</sup>,  
 SO<sub>4</sub><sup>2-</sup>, and NO<sub>3</sub><sup>-</sup>. Thus formed [Co(NH<sub>3</sub>)<sub>6</sub>]NO<sub>3</sub>SO<sub>4</sub> is sparingly sol. in  
 aq. soln. and can be used for sepn. of Co from Ni.

IT **106305-69-5P**

(synthesis of, activated carbon catalyst for oxidn. in)

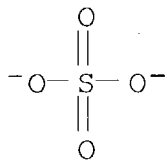
RN 106305-69-5 HCA

CN Cobalt(3+), hexaammine-, (OC-6-11)-, nitrate sulfate (1:1:1) (9CI)  
 (CA INDEX NAME)

CM 1

CRN 14808-79-8

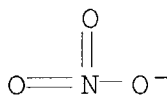
CMF 04 S



CM 2

CRN 14797-55-8

CMF N O3

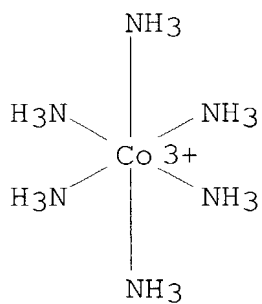


CM 3

CRN 14695-95-5

CMF Co H18 N6

CCI CCS



CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

Section cross-reference(s): 56, 79

ST carbon activated catalyst oxidn cobalt ammonia; cobalt ammino nitrate sulfate synthesis catalyst; nitrate sulfate hexamminocobalt synthesis sepn nickel

IT Oxidation catalysts

(activated carbons, in hexamminocobalt nitrate sulfate synthesis in sepn. from nickel ions)

- IT 7440-44-0, uses and miscellaneous  
(activated, catalysts, for cobalt(2+) oxidn. in sepn. from nickel ions)
- IT 10124-43-3  
(oxidn. of cobalt in soln. of, in presence of ammonia and nitrate and sulfate and nickel ions, activated carbon as catalyst in)
- IT 7786-81-4, Nickel sulfate  
(sepn. of cobalt(2+) from solns. of, activated carbon as catalysts in)
- IT 106305-69-5P  
(synthesis of, activated carbon catalyst for oxidn. in)